

ROADS AND STREETS

WA'S BRIDGES
ALL FIELDS
CONSTRUCTION

JUNE 1949

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JUN 20 1949
DETROIT

50th birthday of the
company whose products you know
by the trade-mark: **TIMKEN**

Since 1899 The Timken
Roller Bearing Company has
been helping American indus-
try get the most for its money.

body likes to buy a "pig in a poke".
America you don't have to. You're pro-
tected by trade-marks like "TIMKEN".

Registered as a trade-mark in the United
States Patent Office, "TIMKEN" iden-
tifies products made by The Timken
Roller Bearing Company - - - Timken
roller bearings, Timken alloy
wheels and seamless tubing, and Timken
movable rock bits.

Experience over the years has shown
Timken products to be the finest in their
respective fields. And many thousands of
men and women are working hard to
keep them that way. No wonder it has
become a habit throughout industry to
look for the trade-mark "TIMKEN". The
Timken Roller Bearing Company, Canton
Ohio. Cable address "TIMROSCO".



IT ADDS UP

Versatility (6 machines in one)

Mobility (fast between jobs)

Productivity (capacity: 60 yds./hr.—5-ton crane)

MORE PROFIT ON SMALL JOBS



Model M-49

The Schield BANTAM is a versatile time-saving money-maker on a wide variety of jobs. Use it as a shovel, trench hoe, dragline, clam, piledriver or 5-ton crane. Interchangeable booms and buckets are installed in minutes. Split type laggings permit proper line speeds and assure high performance on all operations. *Independent boom hoist* allows boom to be powered up or down, or lowered on brake for fast operations. The BANTAM mounts on any 1½-ton truck chassis or larger for maximum mobility. Drives up to the job and digs in. When it finishes one job it rolls on to the next without delays. No costly loading and blocking expense.

Designed for steady going at a profit-making pace, the BANTAM has a capacity of 60 yards per hour when used

as shovel or dragline. As a trench hoe it will dig 100 feet of 5 foot ditch per hour. Built tough where wear is heaviest, rugged where strength is needed. Jack, drum, and swing shaft assemblies are mounted on Timken tapered roller bearings. Drums, swing gears, and vertical swing shaft roll on sealed-for-life ball bearings. All gears and pinions are machine cut. Smooth operating mechanical "snap-in" clutches reduce operator fatigue. Turntable base design protects bull gear from dirt and grit, and modern hook rollers cut maintenance costs by minimizing strain on center pin and wear on turntable roller bushings.

Get complete facts on the BANTAM. Find out how its design and operating features can make small jobs pay bigger profits. Write for new literature now.

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MACHINERY DISTRIBUTORS THROUGHOUT THE
UNITED STATES, CANADA, AND FOREIGN COUNTRIES

THE SCHIELD BANTAM CO., INC.

203 PARK STREET

• WAVERLY, IOWA

THE 1/3 YARD SCHIELD BANTAM



TRUCK MOUNTED SHOVEL • TRENCH HOE • DRAGLINE • CLAM • PILEDRIVER • CRANE

Putting New Link in New York's Route 28



Layer after layer of rock gives way to the steady pounding of tough drill steel.

As ribbon of concrete took shape through heavily wooded area. Through traffic was detoured at this point. Note sign at left.



Rigged with wire rope, power shovel digs into loose rock as truck stands by.



A. B. Conway (left), resident engineer, N. Y. State Highway Dept., chats with John Amodei, contractor's superintendent.



Batch bucket drops top course over Bethlehem Bar Mat. Mat at side of strip is ready for placing. The project used a total of 525 tons of mats.

New York's Route 28, popular scenic highway through the Catskill Mountains, recently underwent relocation in the Ashokan Reservoir area, between Beechford and Hurley. Now in use, the new two-lane road is more than 11 miles in length. It was built by N. R. Corbisello, Binghamton, N. Y. Bar mats and reinforcing bars were supplied by Bethlehem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Timber Bridge Hardware • Tie-Rods
Sheet and H-Piling • Fabricated Structural Steel



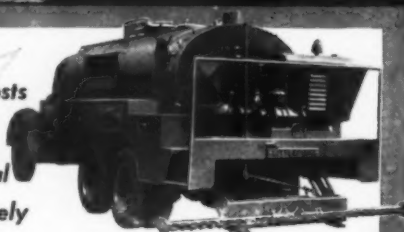
LITTLEFORD

PRESSURE DISTRIBUTOR

"Spray Master"



*cuts operating costs
heats faster
applies material
more accurately*



FULL CIRCULATING SPRAY BAR—Littleford "Spray Master" Distributors have the Full Circulating Vacuum Flow Spray Bar up to 24 feet on width. This Spray Bar circulates by vacuum not pressure, therefore, insures full circulation through the bar without pressure on the nozzles. Spraying is done by pressure.

ONE VALVE CONTROL—One single valve controls all the operations on the "Spray Master." The valve turned to "Spray," the spraying is instant, the valve turned to "Circulate" and the spray stops with razor like accuracy. Then, too, the "Spray Master" single valve can be turned to "Fill" to fill its own tank or "Transfer" to transfer materials from one tank to another.

FOR EFFICIENT SPRAYING—For building or repairing highways, the "Spray Master" is a low cost, labor saving unit that will handle all bituminous materials. There's no lost motion, it heats faster, sprays accurately and efficiently.

MANUFACTURERS OF

"Tanker" Steam Heaters
"Kwik-Melter" Roofers Kettles
Trail-O-Rollers

Highway Brooms
Tool Heaters
Trail-O-Distributors

Asphalt Supply Tanks
No. 101 Utility Spray Tanks
84-HD Asphalt Kettles

"Spray Master" Pressure Distributors



LITTLEFORD

LITTLEFORD BROS., Inc.

454 East Pearl St., Cincinnati 2, Ohio

ROADS AND STREETS

June, 1949

Vol. 92

No. 6

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A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations, and to the construction and maintenance of airports.

With Roads and Streets Have Been Combined Good Roads Magazine And Engineering & Contracting

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LORAIN BUILDS ITS OWN!*



***MOTO-CRANE**—a registered trade mark of the Thew Shovel Co., identifying a complete, integral Thew-built rubber-tire machine—of turntable and carrier—with the carrier designed and built exclusively for a shovel-crane mounting.

● One thing we've learned since we built the original of all truck cranes 30 years ago, is that no commercial motor truck built to transport static pay loads is a proper, long-lasting mounting for the highly concentrated live loads of today's big capacity cranes.

That's why in 1939, Thew-Lorain decided to design its own carrier mounting for rubber-tire cranes—a carrier designed to do a job no motor truck can do—a carrier designed and built completely by a shovel-crane manufacturer exclusively for use as a shovel-crane mounting.

Today over 5000 Lorain Moto-Cranes, all on Thew-designed-and-built carriers are in service. Here's proof that shovel-crane users recognize the "built-from-the-ground-up" advantages of the Moto-Crane's "integrated" design. Ask your nearest Thew-Lorain distributor to tell you why *it isn't a Moto-Crane if it isn't a Lorain.*

THE THEW SHOVEL COMPANY, Lorain, Ohio

CHECK THESE MOTO-CRANE FEATURES

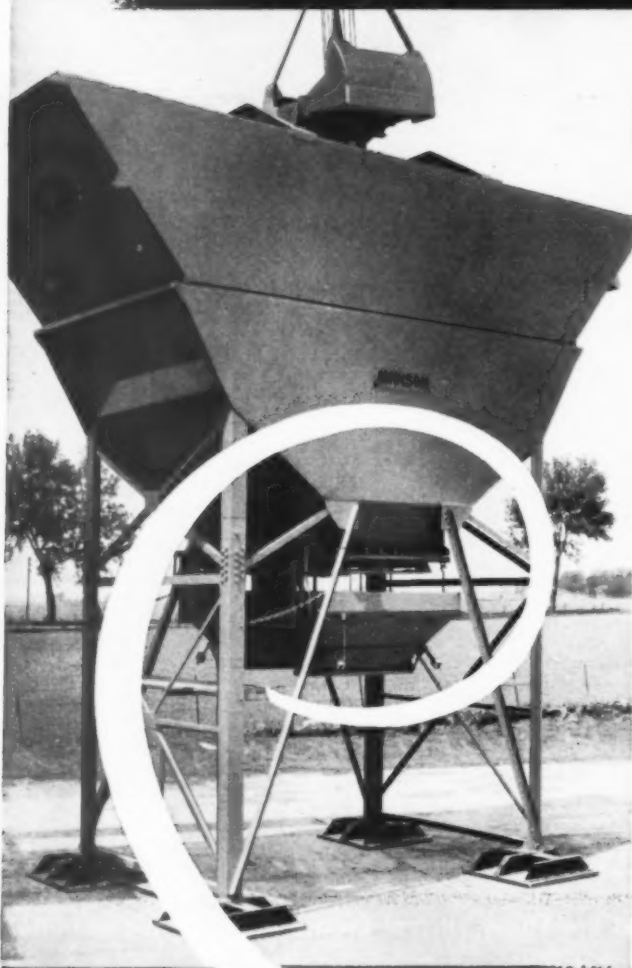
1. A shovel-crane carrier frame with built-in strength—not a makeshift or patch job.
2. 2 or 3 axle models; front wheel drive available.
3. Through drive on rear tandem axles on 6 wheel models.
4. Low and high speed travel ranges, 1 to 30 MPH.
5. Multiple tires for off-the-road soft ground flotation.
6. Thew patented rocker arm replaces springs on rear wheels of 6 wheel models.
7. Tractive effort to climb a 33% grade.
8. 3 sizes of Moto-Cranes; single engine self-propelled units also available on Thew-built carriers.

Lorain®

IT ISN'T A
MOTO-CRANE IF IT
ISN'T A LORAIN

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

For *more* BATCHING SPEED..



JOHNSON *Hi-Speed* Batcher handles 2, 3 or 4 materials

Where you want high-speed batching and extreme accuracy for uniform strength concrete every batch, *plus* quick convertibility to handle 2, 3 or 4 materials, check the Johnson Roadbuilders' Hi-Speed Batcher. Its extra-wide fill valves permit high-speed filling, and retain minimum batcher height.

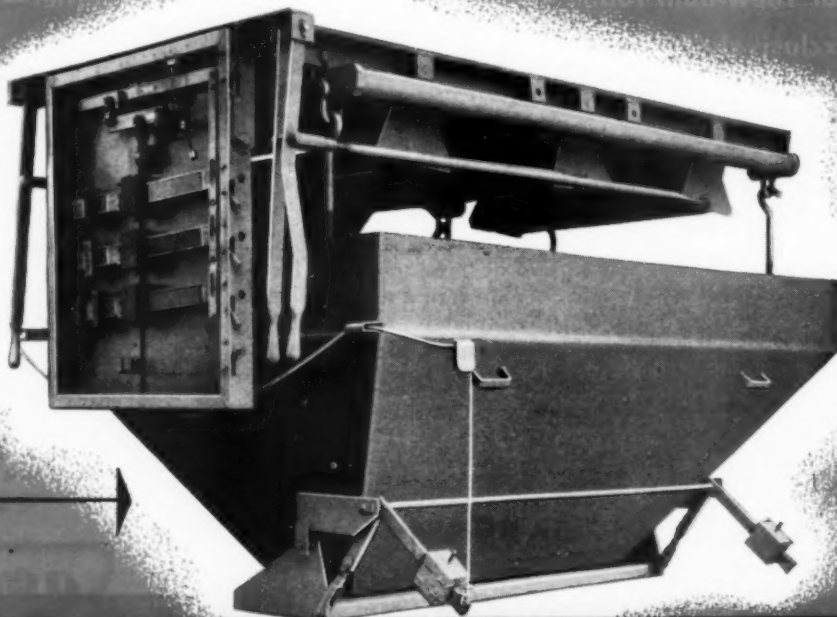
Standard Hi-Speed Batcher has wide-discharge hopper and scale beams to handle standard batch for 34-E pavers. Self-loading, counter-weighted discharge gate on weigh hopper is easily tripped . . . opens wide . . . extra-steep angle of bottom cleans out hopper fast.

For charging truck mixers, Hi-Speed Batcher can also be equipped with 2, 3 or 4-yd. weigh hoppers. Truck-mixer type has 4-compartment bin . . . 1 for sand, 2 for aggregates, and 1 enclosed compartment for cement. Both truck-mixer hopper and wide-discharge hopper are interchangeable on the scale frame. Overhead unit frame supports all fill valves, hand levers, aggregate hopper and weigh beam box . . . provides convenient reassembly, and insures accurate alignment of scale parts at all times.

Let your Johnson Distributor show you *all* the Hi-Speed Batcher features that will help you produce top-quality concrete fast, with most economical use of materials.

One or two Hi-Speed Batcher can be used with Johnson Roadbuilders All-Purpose Type Bin (above) . . . gives you a big production combination.

Hi-Speed Batcher fill valves can be added or removed in the field, and the center spacing easily shifted for either 2, 3 or 4 material bins.



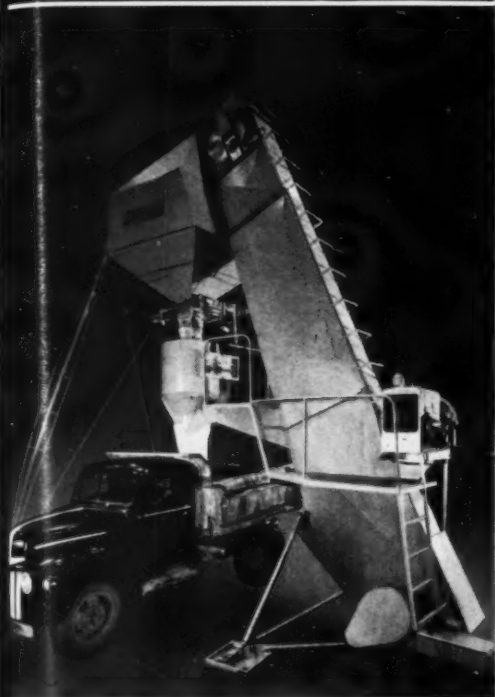
C. S. JOHNSON

D. ACCURACY

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Use JOHNSON Elevating Cement Charger as Batch or Transfer Plant

Here are quick facts on Johnson's new Elevating Cement Charger for batch plant operation or transfer plant to unload cement from either hopper-bottom or box-type railroad cars:

- Standard Charger has a size 14, 1000-lb. capacity cement weigh batcher, hung under a 33-bbl. overhead storage hopper.
- Upper hopper can be equipped with two 1000-lb. weigh batchers for charging dual-batch trucks.
- Quickly adapted from batch to transfer plant by adding 50-bbl. extension hopper.
- Has weather-tight, bucket-type elevator . . . 300 bbl.-per-hour rated capacity with buckets 80% filled.
- Extremely portable . . . easily moved and erected by standard dump truck. No crane needed.

CJ969

COMPANY
KOEHRING SUBSIDIARY
CHAMPAIGN • ILLINOIS

Save 25% with 205 shovel-pull shovel

Koehring 1/2-yard 205 has dual-purpose boom for both shovel and pull shovel operation . . . costs 20 to 25% less than conventional units requiring two separate booms. Crowd and retract cable is self-contained in boom . . . stays intact when boom is removed . . . saves time when you convert to crane, clam-shell, dragline. Get all the facts in new 205 bulletin.



KOEHRING COMPANY

MILWAUKEE 10,
WISCONSIN

Every batch a perfect mix

Improved mixing action of the revolving drum of the Kwik-Mix 16-S Dandie mixes every batch of concrete for perfect texture. You get better concrete because every particle of the aggregate is completely cement-coated. Same thorough mix in all Kwik-Mix Dandie mixers including 3 1/2-S, 6-S, and 11-S sizes.



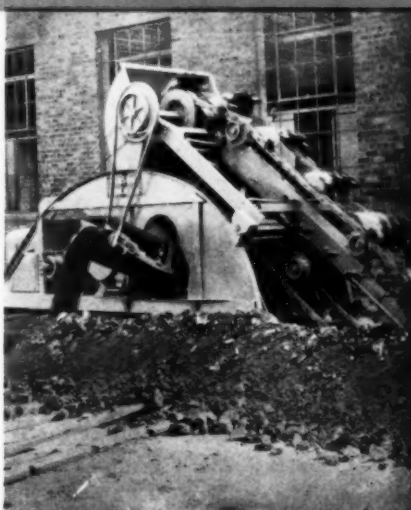
KWIK-MIX COMPANY
KOEHRING SUBSIDIARY

PORT WASHINGTON,
WISCONSIN

Sidesteps side obstructions

Boom of the Parsons 221 Trenchliner* quickly and easily rides on rollers from side to side across the full width of the Trenchliner. That's why the Parsons 221 Trenchliner can cut a trench as close as 10" from side obstructions. Trenches up to 8' depth, 16" to 36" wide.

*Reg. Trade-mark



PARSONS COMPANY
KOEHRING SUBSIDIARY

NEWTON, IOWA

This team saves the taxpayers' money

Not many counties can show a more efficient line-up of road machinery than this one, owned by Butler County, Alabama.

In the picture are 21 pieces of "Caterpillar" equipment! They include husky No. 12 Motor Graders, Tractor-Scraper combinations, Tractors with Bulldozers and with Traxcavators, and rubber-tired DW10 Tractors with "Caterpillar" W10 Wagons. Even the shovel is powered by a "Caterpillar" Diesel Engine.

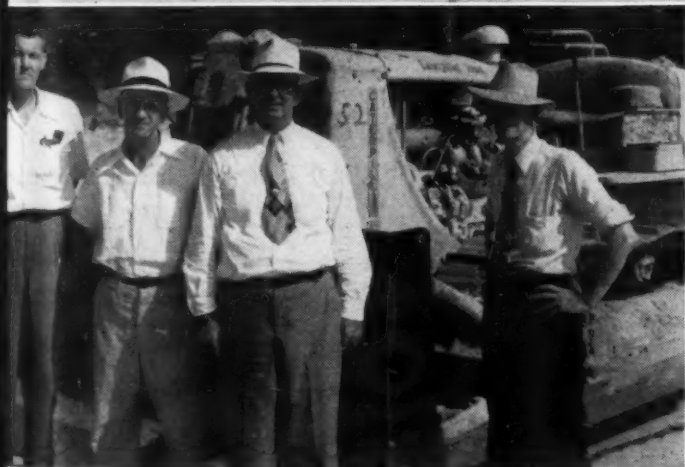
By standardizing on "Caterpillar," the Butler County Commissioners are saving money for their county. They have tough, dependable equipment, built to do the job fast and economically and to last a long time. All their machines are of one make, familiar to the operators, with one manufacturer responsible for the whole line-up. And all service and parts can be supplied by one reliable, well-equipped dealer.

Good roads, built and maintained at low cost, mean happy taxpayers. Write us today for full information and literature on the "Caterpillar" line of matched earthmoving equipment.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.



E. R. Taylor, Engineer, Commissioners R. E. Poole and L. Clay Stabbler and Judge James T. Beeland, Commission Chairman, of Butler County, Ala.



"Caterpillar" Diesel DW10 Tractors and W10 Wagons are used to cut costs on long hauls at high speed. Price of the DW10, complete with Wagon Controls, \$10,720; W10 Wagon, \$4950; both F. O. B. Peoria. Prices subject to change without notice.

DIESEL

**ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT**



Land clearing—or any 'dozer work—is a pushover for International Diesel Crawlers. International diesels have the power and stamina to ram jobs through to completion at low cost and in minimum time.

International Power, geared to the ground by earth-grabbing tracks, puts maximum pull or push into the work for efficient earthmoving.

Get these International diesel advantages: advanced design fuel combustion, simplified fuel injection, positive all-weather starting, sensitive speed govern-

ing with torque control that increases engine torque as much as 15% when the load demands it, and the many other operating and construction features which International crawlers provide. They assure *superior performance, matchless operating economy and low maintenance*; benefits which spell PROFITS for International owners everywhere.

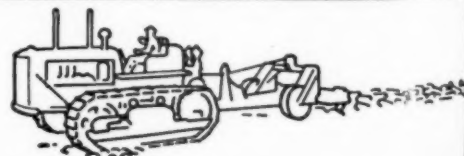
See your International Industrial Power Distributor or write for folder describing the International TD-18 Diesel Crawler.

INTERNATIONAL HARVESTER COMPANY • Chicago

Listen to James Melton and "Harvest of Stars" every Sunday, NBC.

**Standardize
on Power
that Pays**

CRAWLER TRACTORS • WHEEL TRACTORS • DIESEL ENGINES • POWER UNITS



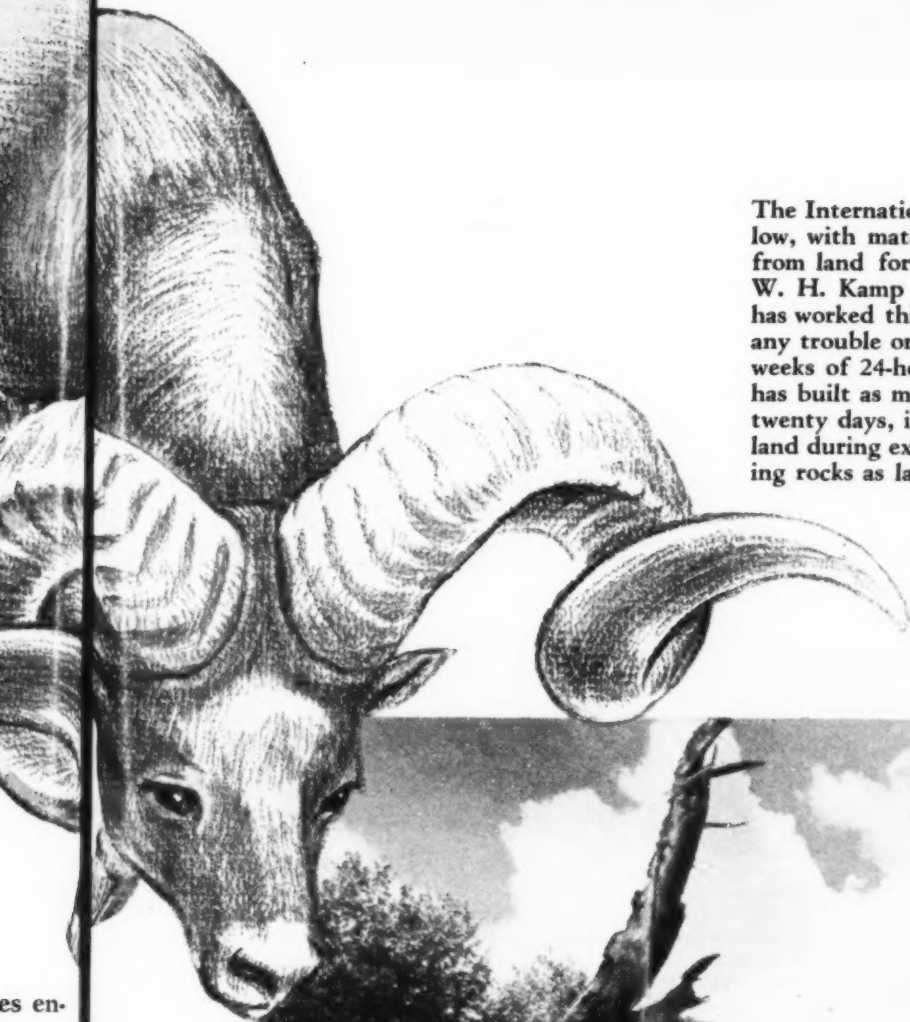
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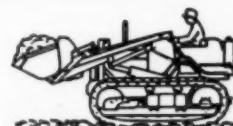
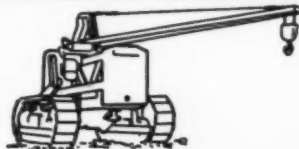
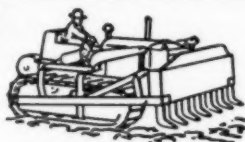
22



The International TD-18 Diesel Crawler, below, with matched bulldozer, clears stumps from land for a Seattle suburb. Its owner, W. H. Kamp of Des Moines, Washington, has worked this tractor for 4½ years without any trouble or repairs. It puts in seven day weeks of 24-hour days at long stretches. It has built as much as 7,000 feet of streets in twenty days, including opening and clearing land during extremely wet conditions, removing rocks as large as five tons and stumps of 10-ft. diameter. "The tractor is just as true today as a new machine," he says, "not sprung in the least and has never been off the tracks!" Quite a record for more than 10,000 hours of operation!

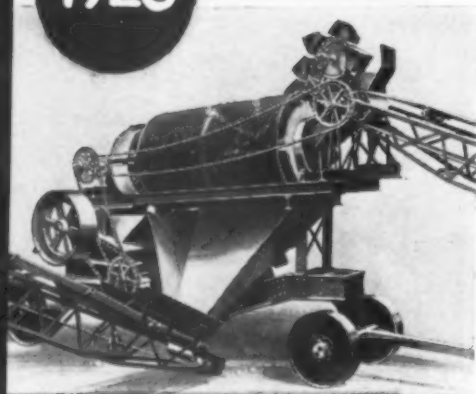


INTERNATIONAL INDUSTRIAL POWER



Year after year Cedarapids give you

1923



BACK in 1923, the Cedarapids One-Piece-Outfit put high capacity aggregate production *on wheels* for the first time. Year after year since then, Cedarapids portable plants have been improved, increasing production from 20 to 250 tons per hour and even more. The use of big roller bearings, manganese steel, rubber tires, V-belts, universal drives, horizontal vibrating screens and hundreds of other improvements have resulted in aggregate producing plants that are world famous for big volume production with the lowest possible operating and maintenance costs, easy portability and highest quality aggregates. Today, there's a full line of Cedarapids Portable Crushing and Screening Plants, in sizes and types to fit every product requirement and every job.

20 tons per hour with this Cedarapids "first", built in 1923...the One-Piece-Outfit consisting of a bucket elevator, a jaw crusher and a revolving screen, all on wheels. With this first

really portable unit, the aggregate plant could be moved wherever necessary to crush and screen whatever was closest to the job, without loss of time or profit-eating costs.

1949

CRUSHING and SCREENING PLANTS



1 Cedarapids Master Tandem producing aggregate for paving a new 4-lane free way through Santa Ana Canyon. With capacities up to 250 tons per hour, the Master Tandem is the all-purpose gravel plant with the versatility to handle many different contract requirements.

2 This Cedarapids Junior Tandem makes traffic-bound material for a modern stone and sand company, whose postwar renovation program has raised the plant capacity from 500 tons to 1500 tons per day.



3 Cedarapids Pitmaster on a Canadian job easily produces 35 cu. yds. per hour, with 55% crushing. The Pitmaster Straightline is the smallest complete Iowa portable crushing and screening plant.

4 Capacities of 250 tons per hour, and more, with Cedarapids Unitized Crushing and Screening Plants, consisting of any combination of the basic primary crushing, scalping, secondary crushing, and wet or dry screening units. Each unit can be used alone or in combination with the others to handle every aggregate job.



Cedarapids

Built by
IOWA

The IOWA LINE of Material Handling Equipment Includes:

ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS - STEEL BINS • BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS • STRAIGHTLINE ROCK AND GRAVEL PLANTS
FEEDERS-TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE PLANTS • PORTABLE
GRAVEL PLANTS • REDUCTION CRUSHERS • BATCH TYPE ASPHALT PLANTS • HAMMERMILLS
DRAG SCRAPER TANKS • WASHING PLANTS • SOIL COMPACTION UNITS • STEEL TRUCKS
AND TRAILERS • KUBIT IMPACT BREAKERS

Buy the Best... Buy

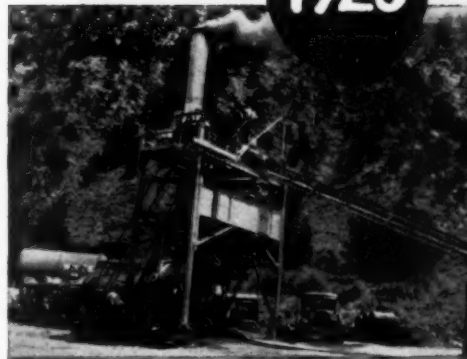
**Give you more production
more profit
less maintenance!**

TIME has brought many changes in machines and methods since the first Cedarapids Pre-Mix Asphalt Plant was setting records of 30 tons per hour . . . high production for the first portable plant of the 20's! Now the need for output as high as 100 tons per hour of accurately batched materials has resulted in the modern Cedarapids line of Bituminous Mixing Plants, known throughout the industry for their great capacities, low upkeep and low operation costs. Made up of matched screens, pug-mills, batchers, elevators and other component parts, they are built for maximum efficiency, easy portability and economy. They produce a steady flow of thoroughly mixed materials.

30 tons per hour with the first Cedarapids Pre-Mix Asphalt Plant. Continuing research and the development of increasingly better

machines have enabled Cedarapids to give you greater production of bituminous mixes at lower operating costs that assure good profits.

1923



ITS BITUMINOUS MIXING PLANTS

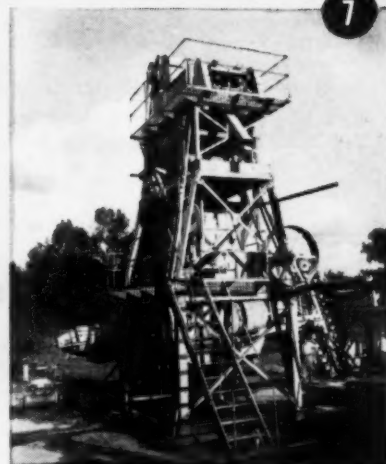
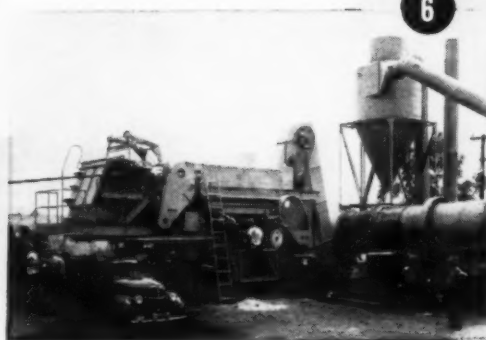
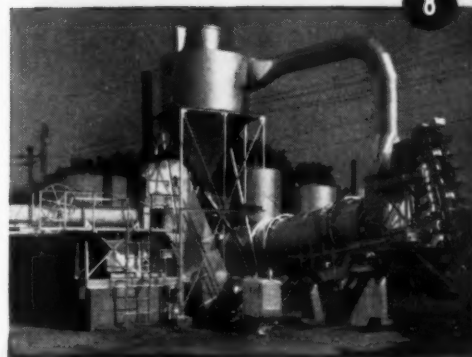
1949

5 Cedarapids Model "E" Batch Type Bituminous Mixing Plant produced an average output of 700 to 800 tons per day on an airport job that called for mixing 305,700 sq. yds. of flexible base and asphalt surface runways.

7 This Cedarapids 1000 lb. Model "A" Bituminous Mixing Plant produces a steady 200 to 250 tons per day. Accurate batching, thorough mixing and simplicity of operation keep product quality high and costs low.

6 Model "FA" is the most portable Batch-Type Bituminous Mixing Plant in the Iowa line. Can be set up ready for operation in a few hours. This plant, operating in Ohio, produces 450 tons of bituminous materials per day.

8 Cedarapids Patchmaster, a rugged, low-cost continuous-mix Bituminous Mixing Plant, produces 30 tons per hour and more of uniform, thoroughly coated and mixed aggregate. This Patchmaster can be equipped with a 48" x 16' Cedarapids Drier and Dust Collector.

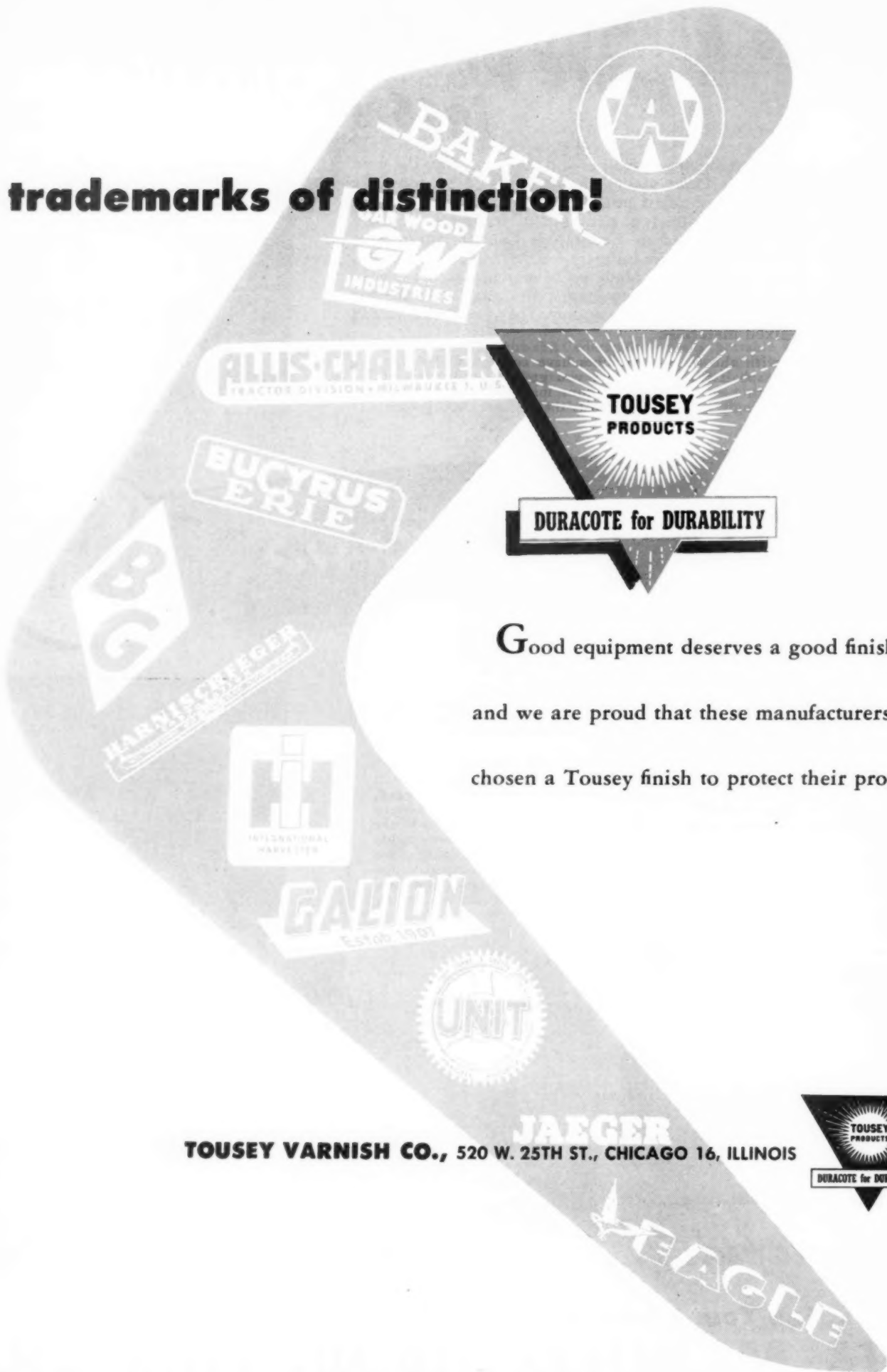


Buy Cedarapids . . .

See Your Cedarapids Distributor For Full Details

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

trademarks of distinction!



**TOUSEY
PRODUCTS**

DURACOTE for DURABILITY

Good equipment deserves a good finish,
and we are proud that these manufacturers have
chosen a Tousey finish to protect their products.

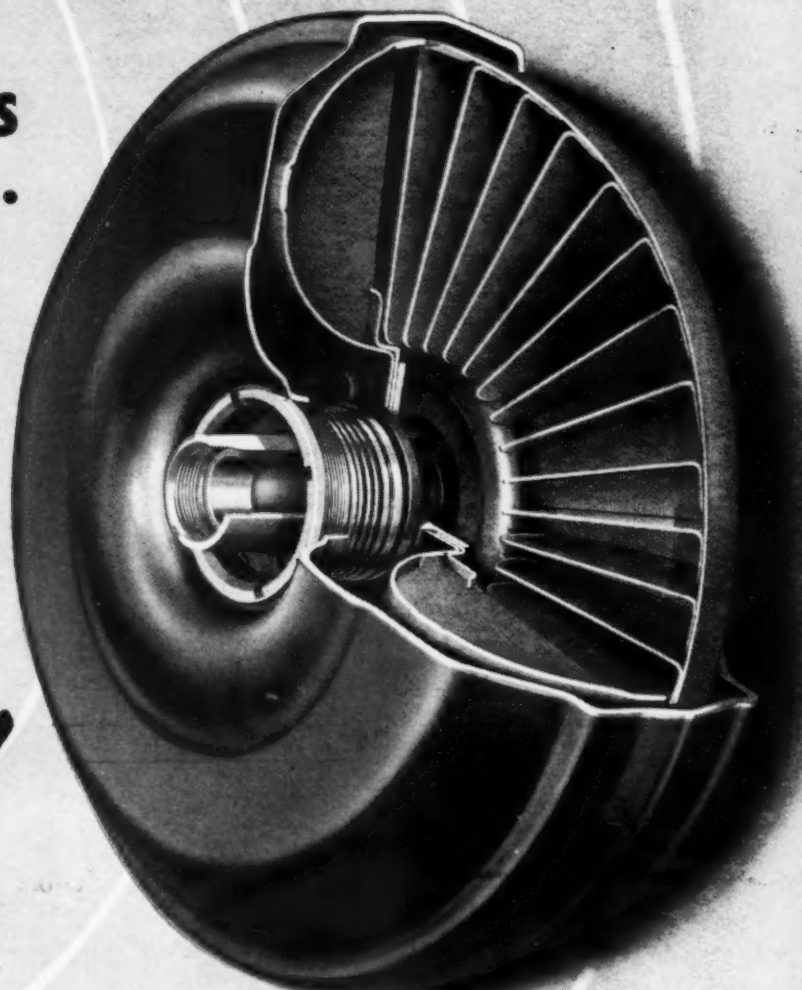
TOUSEY VARNISH CO., 520 W. 25TH ST., CHICAGO 16, ILLINOIS



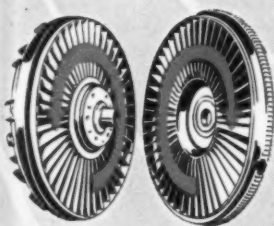
Great News from Chrysler!

**CHRYSLER
INDUSTRIAL ENGINES
now available with...**

gylrol
Fluid Drive
*at Amazingly
Little Cost!*



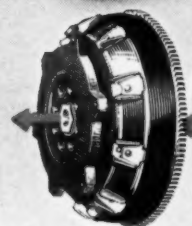
Actually only slightly more than the conventional flywheel which it replaces.



Driver and Runner flywheels are shaped like shallow bowls fitted inside with fins. They operate as separate units, with no mechanical connection—no metal-to-metal contact.



As the Driver turns inside the sealed steel drum, the confined oil produces a powerful swirling out-thrust. Instantly, the Runner receives the impulsion and transmits smooth power to the load.



The coupling is an integral unit. No adjustments are necessary. Oil maintains required fluidity over a wide temperature range. Remains unaffected by seasonal temperature changes.

PROVED on more than a million Chrysler, DeSoto and Dodge passenger cars and trucks over a period of 11 years.

PROVED on thousands of industrial jobs—scores of applications under rugged field conditions.

Chrysler's famous Fluid Coupling opens a whole new field for the improved operation of power equipment! A way to reduce excessive clutch wear! A way to protect equipment from damaging shock overloads! A way to get gradual oil-smooth acceleration. A way

to assure better performance, longer wear and lower upkeep. A way to secure many other advantages peculiar to your equipment.—at negligible small cost!

Tell us your needs. See your Chrysler Industrial Engine dealer or write us. Parts and service quickly available everywhere. **Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.**

CHRYSLER

**Industrial Engines and
Power Units**



HORSEPOWER

WITH A PEDIGREE

THE BLAW-KNOX COMPLETE PACKAGE has *EVERYTHING* for low cost concrete construction

IN the Blaw-Knox complete package, there's every piece of construction equipment you need to put your work on a cost-cutting assembly line basis. Profits start with Blaw-Knox Clamshell Buckets, increase as the work flows steadily step by step to the other Blaw-Knox machines . . . each one engineered to speed production and lower costs.

Economy-minded construction men use the Blaw-Knox ONE SOURCE package . . . it means modern design, time-saving repair and parts service, and assures a unified production set-up that operates at a profit on every job. Your Blaw-Knox distributor will give you complete details.

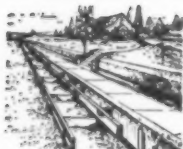
PORTABLE AGGREGATE BATCHING PLANTS — You get accurately batched aggregates *faster* and at lower cost with these flexible, high capacity units, developed to meet today's high speed construction demands. Designed to fit the requirements of your particular job, they are available in 2, 3 and 4 compartment styles, in capacities ranging from 100 to 120 tons. All-steel, self-cleaning storage bins with steep hopper slopes insure rapid and complete discharge. Easy set-up and

take-down saves time, cuts haul costs. Beam scales or dial scales are optional.

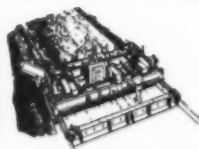
PORTABLE BULK CEMENT PLANTS — Cut your costs of handling large volumes of cement. 200 and 400 barrel sizes are furnished, with combination arrangements which double these capacities and still retain complete portability. Speedy erection and relocation eliminates lost time between jobs. Plant includes portable bin, cement weighing batcher of required size with scales, filling and discharge gates, dust cover and discharge chute; also, 50 t.p.h. enclosed type cement elevator with screw feeder and either electric motor or gas engine drive.

CENTRAL MIXING PLANTS — Concrete, batched and mixed in one plant, assures accurate, uniform batches, eliminates waste, speeds construction and keeps costs low. These high production units offered in composite bin styles with 2, 3, 4, or 5 compartments, and capacities to meet your job requirements. Weighing batcher discharges into stationary mixer or through dry batch chute into truck mixers.

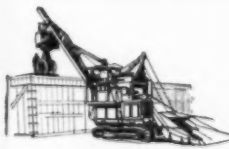
BLAW-KNOX CONCRETE BUCKETS speed your work, cut concrete pouring costs. Ease of opening and closing discharge gate under full load, plus one-man operation with full or partial load, means fast, high-volume production. Roller-Gate Controllable Discharge Buckets, with exclusive discharge gate design, are available in sizes from 1 to 8 cu. yds. for normal and low slump concrete. For placing concrete under water, Tromie Type Buckets from 1 to 8 cu. yds. capacity are furnished. Double Clam-Gate Buckets are offered in 3 sizes— $\frac{1}{2}$, $\frac{3}{4}$ and 1 cu. yd.—for general construction work.



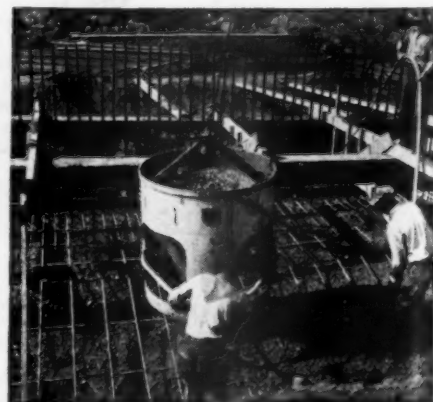
STEEL STREET FORMS



PRECISION SUBGRADERS



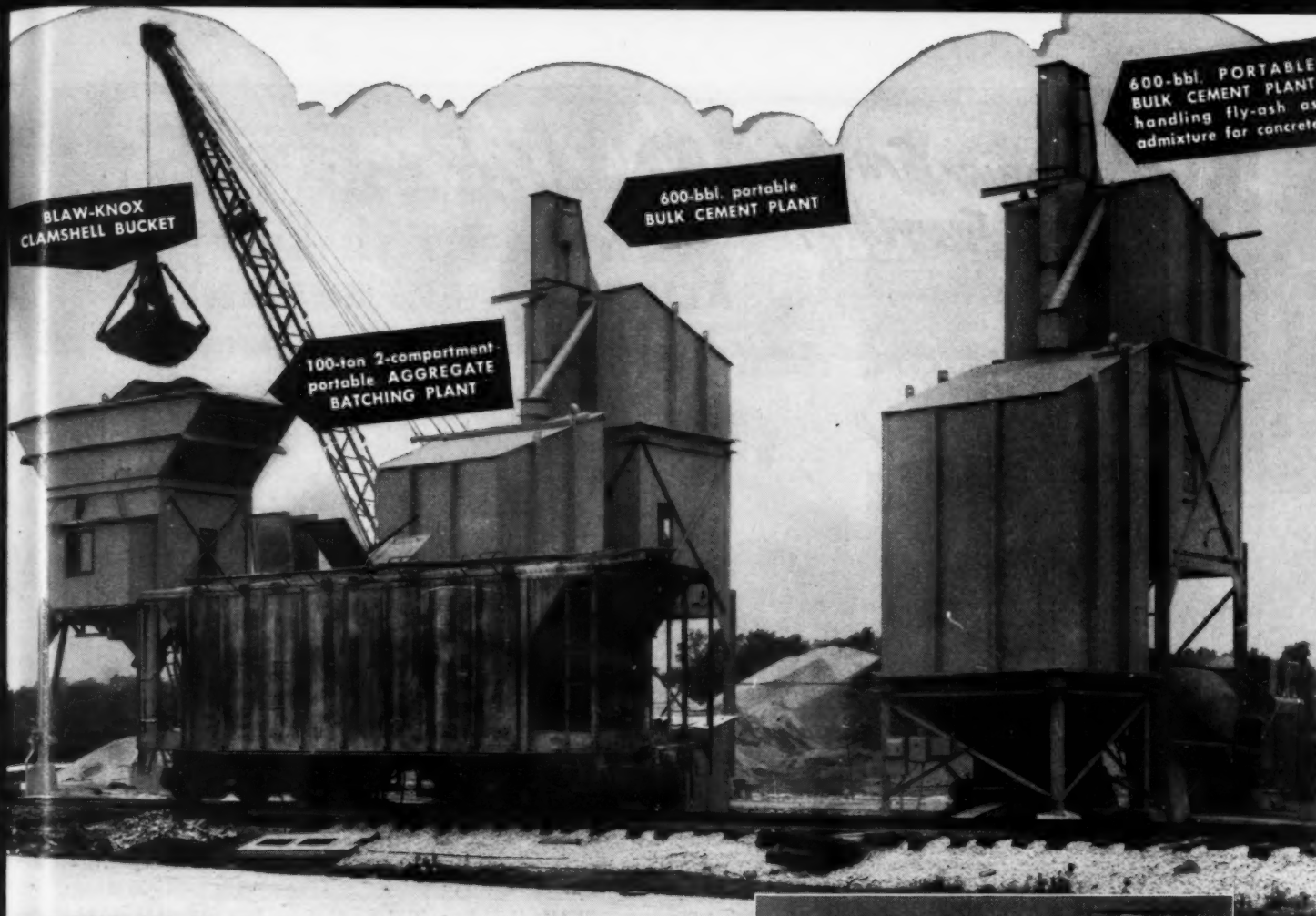
MULTIFOOTE PAVERS



BLAW-KNOX

BLAW-KNOX DIVISION OF Blaw-Knox Company,
Farmers Bank Building,
Pittsburgh 22, Pa.

The Foote Co., Inc.,
Subsidiary of Blaw-Knox Co.,
Nunda, N. Y.

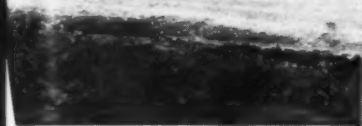


BLAW-KNOX
CLAMSHELL BUCKET

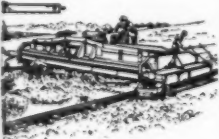
100-ton 2-compartment
portable AGGREGATE
BATCHING PLANT

600-bbl. portable
BULK CEMENT PLANT

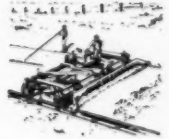
600-bbl. PORTABLE
BULK CEMENT PLANT
handling fly-ash as
admixture for concrete



THE BLAW-KNOX HI-BOY TRUK-MIXER with the exclusive REVOLVING HOPPER, permits faster charging, faster discharging, with minimum seal maintenance. Mixes concrete thoroughly and uniformly, and discharges all the concrete in the drum, without segregation.



PAVING
SPREADER-VIBRATORS



FINISHING MACHINES

Also: Steel Paving Forms, Truck Mixer Loading Plants, Adnun Black Top Pavers, Kinetic Mixers.

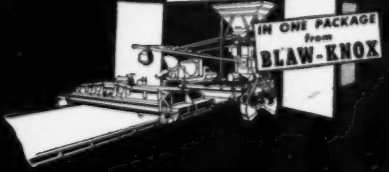


BLAW-KNOX CENTRAL MIX-
ING PLANT with multi-
compartment bin for aggre-
gate and cement storage

FROM FORMS
TO PAVES
TO FINISHER...
ALL YOUR
PAVING
EQUIPMENT

IN ONE PACKAGE
from
BLAW-KNOX

New York • Chicago • Philadelphia
Birmingham • Washington
Representatives in Principal Cities



*The Power Grader
that has Everything*

Now there are 3

**DIFFERENT IN SIZE
ALIKE IN PERFORMANCE**



the New "88-H"

Bringing to the field of medium-sized graders the extra power and traction of all-wheel drive, and the unequaled maneuverability of all-wheel steer.



"99-H" 12 years a "champ"

The "old reliable." Leader of the motor grader parade since the original "99" of 1938. Unexcelled for heavy duty, all-around performance.



the New MASTER "99"

If your work requires the utmost in power, traction and speed, your nearby A-W distributor will probably call it the best buy of the three for you.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U.S.A.

BUILDERS OF ROAD MACHINERY
Austin Western
SINCE 1889

Take a **LONG LOOK**

at

**BUCYRUS
ERIE**

4-Wheel Scrapers...



S-68 scraper (6 cu. yd.) moves sand and clay fill on creek-rerouting job in Pennsylvania. Averaged 112 yards per hour on 900-foot haul (one way).

... Because these new scrapers are packed with advantages for producing more yards per hour on your dirt moving contracts. Run through the features listed here — consider what they mean to you in greater output and lower costs. Then ask your International Industrial Tractor distributor for added facts!

BUCYRUS-ERIE CO., South Milwaukee, Wisconsin

• • •

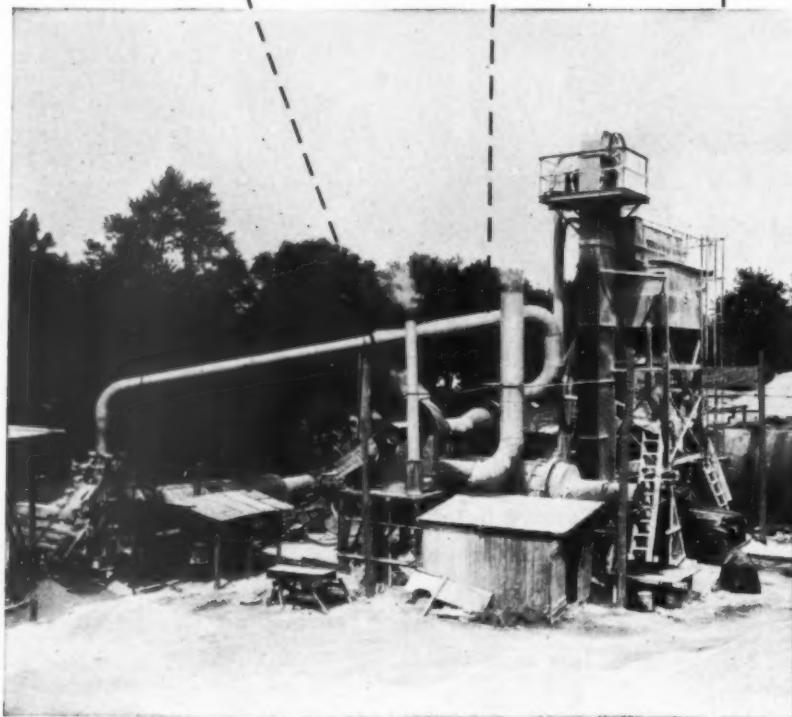
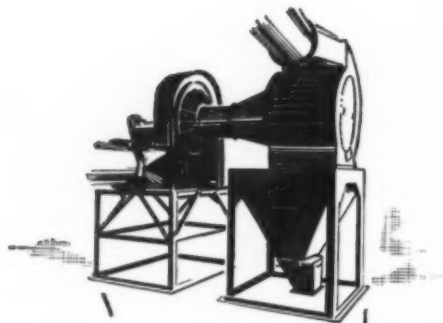
- ✓ The famous Bucyrus-Erie double-curve cutting edge means heaped uniform loads, more pounds of dirt per cubic yard of rated capacity.
- ✓ Positive rolling ejection—quick clean dumping.
- ✓ Adjustable two-part apron — fits apron action to the job.

- ✓ Low-centered stability — scraper clings to steep slopes.
- ✓ Positive flotation—big low pressure tires, same size all around.
- ✓ Straight line cable reeving, no side bends — low rope wear.
- ✓ Adjustable bar-type push bumper, positive bowl return, reversible side cutters, sliding type bowl lock, wedge-socket cable anchors.
- ✓ S-Type units in 4, 6, 8, and 10 cubic yard (struck) sizes.
- ✓ B-Type units in 15 and 22 cubic yard (struck) sizes, for use with International TD-24 tractors.

145T49

See Your INTERNATIONAL Industrial Tractor Distributor

ROTO-CLONE turns a Complaint into a Compliment



... Proving that Aggregate Dryers need not be a source of Public Aggravation

THE Lehman-Roberts Company, highway contractors, operate two asphalt plants in Lexington, Ky. And, in both instances, escaping dust from the aggregate dryer was resulting in neighborhood complaints. Several methods of dust control were tried with so little success that the local Board of Health threatened to shut down both plants.

At this point, AAF engineers were consulted and after analyzing the problem recommended the installation of a Skimmer Precleaner operating in conjunction with a Type W Roto-Clone (Arrangement A). Today, all is serene. Once complaining neighbors are now complimenting Lehman-Roberts on the cleanliness of their operations. What's more, the Precleaner is salvaging the fine filter material, formerly wasted, for improving the quality of the mix.

Which do you prefer? Complaints or compliments? Roto-Clone Dust Control can assure the latter with savings thrown in for good measure. Write today for complete information.

American Air Filter Co., Inc.
306 Central Avenue, Louisville 8, Ky.
In Canada: Darling Bros., Ltd. Montreal, P. Q.

AAF

**ROTO-CLONE
DUST CONTROL EQUIPMENT**

LIMA TYPE 802

SHOVEL and CRANE COMBINATION

Solves an "unusual" Construction Problem

TELEPHONE
BALDWIN 8-2600

DEL BALSO CONSTRUCTION CORPORATION
500 ZENEGA AVENUE
NEW YORK 21, N. Y.

October 15, 1948

Construction Equipment Corporation
11-22 Forty-Third Avenue
Long Island City 1, N. Y.

Gentlemen:

As of the time of writing this letter, we have been working on the construction of the Brooklyn-Queens Connecting Highway for about two years and during all that time the two key machines on this project have been the Lima 802 shovel and crane combinations which we purchased from you.

As you know, this contract presented an unusual concrete placing problem because of the narrowness of Furmen Street and the height of the three deck cantilever highway which we are constructing. We were forced to work very close to the structure and at the same time had to effect maximum reach. To do this, as you know, we put a 40 foot adjustable jib on a 70 foot boom to give us what in effect is a goose-neck. We have been pouring approximately 40,000 yards of concrete to-date with these two machines.

Our contract also involves a sizeable shovel excavation job which had to be done sporadically. We found it a very simple operation to change one of these machines from a crane to a shovel at very short notice.

In addition, during the past two years we have not shut the machine down at any time for repairs due to breakdown or mechanical failure.

We have been most pleased with the performance of these rigs and their adaptability to meet a special and very difficult situation.

Very truly yours,

DEL BALSO CONSTRUCTION CORPORATION

Del Balso



On this job, the crane operator had to work "blind" most of the time. Traffic had to be maintained, ruling out gantry-type cranes. Heavy equipment was barred in this residential area. The only effective way to place concrete and other materials was with a crane that combined the ultimate in flexibility and capacity. LIMA 802's did the job perfectly!

Machine illustrated has 70 ft. boom, 40 ft. jib and 2 yard bucket. Note that clearance at rear of machine and front of boom is practically nil.

The two standard LIMA 802 combination machines owned by Del Balso have worked safely—under UNUSUAL conditions—for two years without "down-time"—a tribute to their tremendous reserve of lifting power and capacity. The LIMA line includes Shovels ¾ to 6 yds., Cranes 13 to 110 tons and Draglines variable.

It will pay you to consult your nearest Lima Sales Office or representative before you buy your next shovel, crane or dragline. Offices in principal U.S. cities.

Lima Shovel and Crane Division

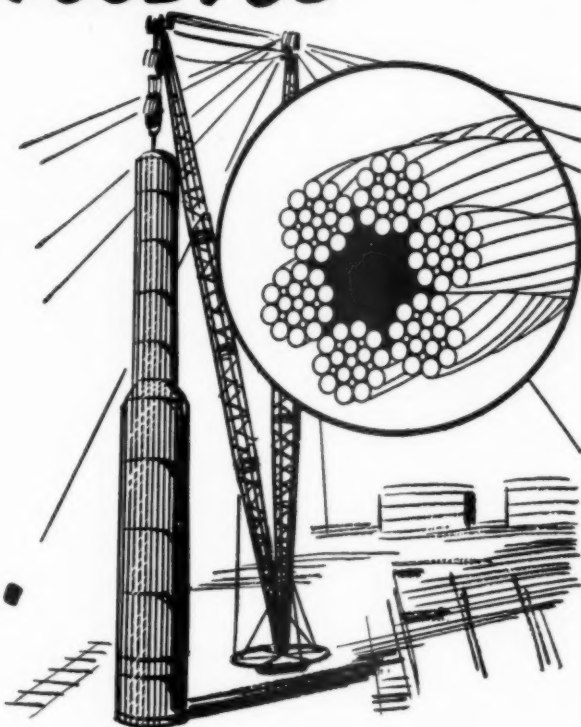
LIMA, OHIO

OTHER DIVISIONS: Lima Locomotive Works Division; Niles Tool Works Co.; Hooven, Owens, Rentschler Co.

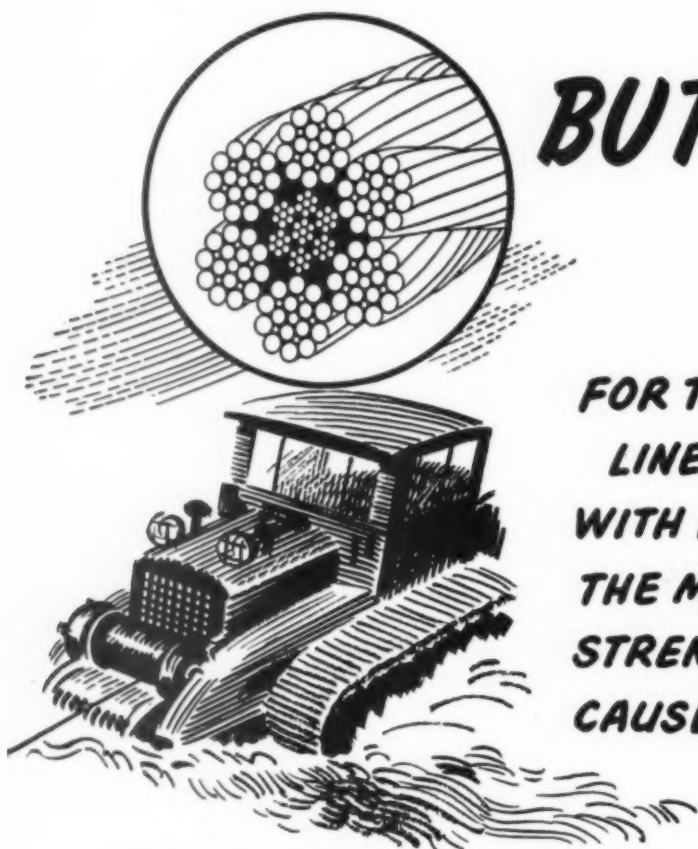


SOME ROPES FOOL YOU

***U-W 6X19 FILLER WIRE CABLE
WITH HEMP CENTER IS OK FOR
TACKLE BLOCK FALLS BECAUSE
IT IS SUFFICIENTLY FLEXIBLE
AND FATIGUE RESISTANT***



BUT...



***FOR TRUCK AND TRACTOR WINCH
LINES U-W 6X19 FILLER WIRE
WITH I.W.R.C. IS BETTER BECAUSE
THE METALLIC CENTER ADDS MORE
STRENGTH AND RESISTS CRUSHING
CAUSED BY DRUM CROSS WINDING***

**For longest and best service, always specify
U-W LAYRITE (Preformed) IMPROVED PLOW STEEL**

We invite you to let UPSON-WALTON engineer your tough rope jobs.

Copyright 1948—The Upson-Walton Company

THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks, Brattice Cloth

Main Offices and Factory: Cleveland 13, Ohio

114 Broad Street
New York 4

3525 West Grand Ave.
Chicago 51

241 Oliver Building
Pittsburgh 22





MODERN HIGHWAYS Made *Safer* with..

SEAMAN STABILIZED SHOULDERS

Seaman Pulvi-Mixers Handle Any Type of Stabilization

Highways are carrying more traffic, heavier traffic, faster traffic which means only one thing—more safety must be built into the highway. Safety in the form of stabilized shoulders . . . load bearing surfaces that increase the width of highways and speed traffic flow.

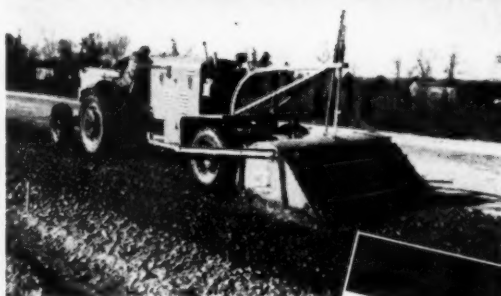
Stabilized shoulders also reduce highway maintenance costs substantially—assist in preventing frost boils, frost heaving, volume changes in sub-grade soils, edge breaking, etc. Constant patrolling with motor graders, applying aggregate, replacing aggregate are all maintenance cost factors eliminated by properly stabilized shoulders.

The Seaman Pulvi-Mixer is the one machine that handles all types of stabilization . . . turf, soil-cement, bituminous . . . Macadam, calcium chloride . . . one-man operated, it pulverizes and mixes right up to the slab, to any desired width or depth, in lifts if desired, using native soils or aggregate, and leaves a level graded surface ready for compaction, rolling, seeding or mulching.

If you are planning a shoulder stabilizing program, get the complete story on the Seaman Pulvi-Mixer first. It's the one machine that does the entire job at lowest cost per yard.



Seaman, processing soil-cement shoulder on Lake County, Illinois, project.



All types of bituminous surfacing are handled "in place" with a Seaman.

Send for Free Booklet
New, 24-page booklet contains latest authentic information on all types of Shoulder Stabilization processes and methods.



SEAMAN MOTORS, INC.



New Places for **PREFORMED** **WIRE ROPE**

Men who build new machines and men who run old ones know that Preformed Wire Rope is an efficient, economical and dependable medium for transmitting motion.

BECAUSE—

- Preformed lasts longer
- Preformed handles easier
- Preformed is safer to use
- Preformed saves installation time

Now is the time to take advantage of the savings Preformed wire rope offers. Ask your supplier about it. Then specify Preformed wire rope on your next order.



Asphalt resurfacing ... a modern magic carpet

ASPHALT resurfacing has proved to be a modern magic carpet for both road-builders and road-travellers. It has helped highway departments and contractors reach new speeds in road-rebuilding. It has provided safe, smooth-riding travel for highway users.

One method of asphalt resurfacing is described below. Standard Oil Asphalt Department Representatives can suggest other types of asphalt construction to meet your needs and local conditions. Write Standard Oil Co. (Ind.), 910 S. Michigan Ave., Chicago 80, Ill.

Steps in one method of Asphalt resurfacing construction

Spot Patching—Where the old highway is badly broken, holes are patched by filling with an asphalt-aggregate mix delivered hot from a central mixing plant.

Prime Coat—This is a thin coat of cut-back asphalt spread over both the old road surface and the patches that have been brushed clean. When used, it helps to bind the asphalt to the old surface.

Binder Course—An asphalt-aggregate mix is delivered

hot from the central mixing plant to an asphalt finishing machine and is laid from 2 to 3 inches deep over the old road surface and patches.

Wearing Course—This is the top course composed of asphalt, stone, and sand. It is mixed hot at the central mixing plant and laid by machine. This top course presents a smooth, waterproof, long-wearing surface which requires no seal coat or stone application.

STANDARD OIL COMPANY (INDIANA)



"More hauls, fewer overhauls with Gulf Quality Lubricants and Fuels"

says Mississippi Levee Contractor



Pioneer Contracting Company, Memphis, Tennessee, has a big share of the new levee construction work at Fidler, Mississippi, and south of Vidalia, Louisiana. Gulf quality lubricants and fuels are helping this contractor keep equipment on the job and operating efficiently.

EARTH-MOVING for a Mississippi levee project is measured in the millions of yards! It is the kind of job on which the contractor is not likely to take chances with his equipment. He wants the best lubrication and the most efficient fuels to insure top performance and prevent costly mechanical delays.

That is why Pioneer Contracting Company selected Gulf quality lubricants and fuels for its big

levee project, which involves moving over 4 million yards on a tough time schedule—a grueling test for men and equipment.

Pioneer Contracting Company, and many other leading contractors, use Gulf quality lubricants and fuels as basic profit insurance. They know that Gulf products make the job run smoothly and efficiently—keep operating costs at rock-bottom levels.



Gulf Oil Corporation • Gulf Refining Company

**Division Sales Offices: Boston • New York • Philadelphia • Pittsburgh
Atlanta • New Orleans • Houston • Louisville • Toledo**



How long should a CONSTRUCTION truck last?

The life of any truck depends upon many things.

It depends upon the miles the truck is driven; on the care taken to keep it in good condition.

But more than all else, truck life depends on how closely the truck *fits* the job it must do.

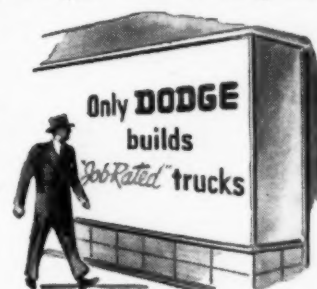
Dodge "Job-Rated" trucks last longer, and at low maintenance cost . . . because they *fit the job*.

It stands to reason that you waste money with a truck that's too big for its job; or, if your trucks are too small for the job, you're in for plenty of costly maintenance expense . . . and early replacement.

From 248 basic chassis models your Dodge dealer can specify a truck that will be "Job-Rated" exactly for your hauling job.

Such a truck will have the right one of 7 great truck engines . . . "Job-Rated" for top efficiency and economy. It will have the right units throughout . . . to haul *your* loads, over *your* roads.

And remember . . . only Dodge builds "Job-Rated" trucks. Talk to your Dodge dealer!



For the good of your business—

Switch to **DODGE**
"Job-Rated" **TRUCKS**



Drainage Job with a "HAPPY ENDING"

When you finish off your pipe or PIPE-ARCH Culvert with an ARMCO End Section it means a "happy ending" to another drainage job.

ARMCO End Sections meet all the requirements of modern culvert end treatment. Upstream the flared design cuts entrance loss. Downstream it retards undermining and undercutting. ARMCO End Sections fit the slope to blend with any landscaping treatment. There are no obstructions above the shoulder grade—a vital aid to highway safety—and nothing to interfere with maintenance operations such as mowing and snow removal.

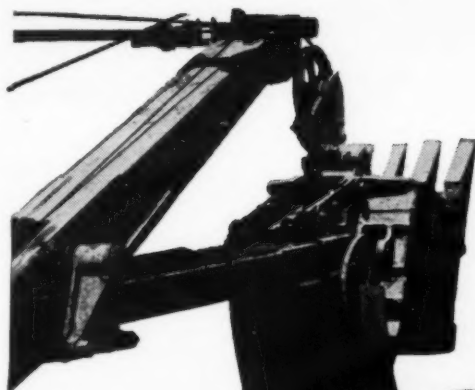
You'll like the savings in time, money and labor that go with ARMCO End Sections. Installation is simple and fast. Unskilled men quickly attach them

to pipe or PIPE-ARCH Culverts with sturdy band couplers. No special tools are required and there are no curing delays or follow-up operations.

Sizes are available for full round pipe in diameters from 8 to 48 inches, for PIPE-ARCH from 17 x 11 to 72 x 44 inches. Write for additional information. Armco Drainage & Metal Products, Inc., 2545 Curtis Street, Middletown, Ohio. Export: The International Corporation.



ARMCO END SECTIONS



You should talk
to the owner of this truck!



International KB-7 with dump body



THE OWNER of this International KB-7 uses a dozen International Trucks in his engineering work. (Four are dump trucks, 2 flat beds, 1 oil spreader and 5 Concrete Ready-mix.) He knows what they can do, and how well they do it.

He speaks from experience when he says:

"The new KB-7 dump truck is a pleasure to drive, and has been getting 9½ miles to the gallon of gas under conditions which should use a good deal more—that is, a lot of starting and stopping and short hauls."

And we aren't exactly speaking as amateurs in the business when we tell you this:

International Trucks are the products of 42 years of real truck engineering. They are available in 22 basic models, 1000 truck combinations, gross weight ratings from 4,400 to 90,000 pounds—to give you the truck that's specialized right for your job. And, they're backed by the nation's largest exclusive truck service organization.

Talk to any International Truck owner. Talk to any International Truck driver. Then you'll know why it will pay you to see your International Truck Dealer for the very next truck you buy. Call him soon.

International Harvester Builds McCormick Farm
Equipment . . . Farmall Tractors . . . Industrial Power
Motor Trucks . . . Refrigerators and Freezers



Tune in James Melton and "Harvest of Stars"
NBC, Sunday afternoons

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY • CHICAGO

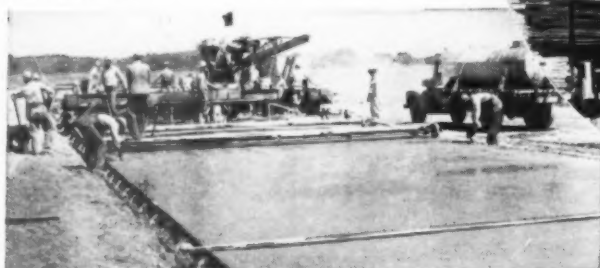
When writing advertisers please mention **ROADS AND STREETS**, June, 1949

Mechanical Dowel AND TIE-BAR INSTALLER

AIRPORT CONTRACTORS—SAVE TIME AND MONEY

You eliminate stakes, complicated holding harness and expensive hand labor, and are assured of perfect alignment with this Flex-Plane installer. Job tested for three years, this machine has demonstrated substantial savings in time and money. Let us tell you how—write today to Flex-Plane, Warren, Ohio, for Bulletin J-105.

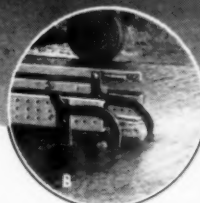
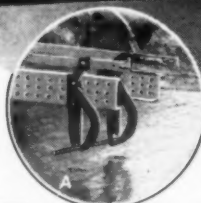
- ADJUSTABLE TO VARIOUS DOWEL SPACINGS
- ADJUSTABLE TO VARIOUS PAVEMENT WIDTHS
- INSTALLS IN EXACT POSITION AND ALIGNMENT
- CUTS JOINTS



Note smooth pavement surface after installation. Regular floating was all that was required.

FLEX-PLANE
WARREN OHIO

(FLEXIBLE ROAD JOINT MACHINE COMPANY)



- A. Bar gripped by mechanical fingers ready for vibrated insertion into plastic concrete. Tie-bars and dowels easily insert into fingers.
B. Bar has been worked, by vibration, to pre-determined depth. Rear holding finger was disengaged as bar started through concrete.
C. Completed operation. Vibrated removal of fingers assures complete seal of plastic concrete. Surface disturbance is minor.

**GREATER YARDAGE!
LOWER COST!**

WELLMAN *Williams* WELDED BUCKETS



SEND FOR
BULLETIN

Wellman Buckets cost less to maintain because they are ruggedly built. They deliver bigger payloads because they are properly designed. The superior engineering in Wellman Buckets gives the operator better balance, easier handling, cleaner digging. Wellman pioneered the unique construction that pays off in greater yardage at lower costs. There's a Wellman Bucket for every service.

THE WELLMAN ENGINEERING COMPANY

7003 CENTRAL AVENUE

CLEVELAND 4, OHIO

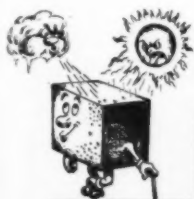
HYDROPEL

The Integral Waterproofing Admix for Concrete
That "Tops" Them All.

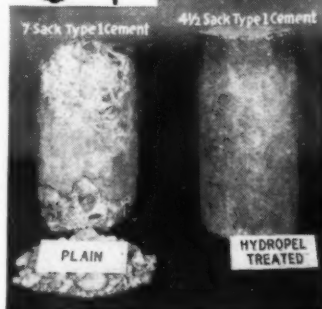
Another Product
Pioneered By

Bitumuls

Portland Cement Concrete—accepted world-wide—
receives its greatest modern improvement when
HYDROPEL is added. We invite your appraisal.



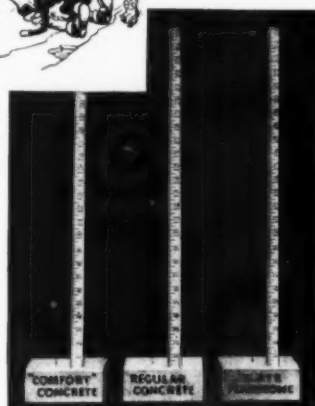
Resists FREEZE-THAW (Expansion & Contraction)



In combating freeze-thaw action, 4 1/2 -sack Hydropol Concrete outperforms 7-sack plain concrete. New England cities specify Hydropol Concrete in curbs and sidewalks where de-icing salts are used.



WARM & RESILIENT (Comfort Concrete)

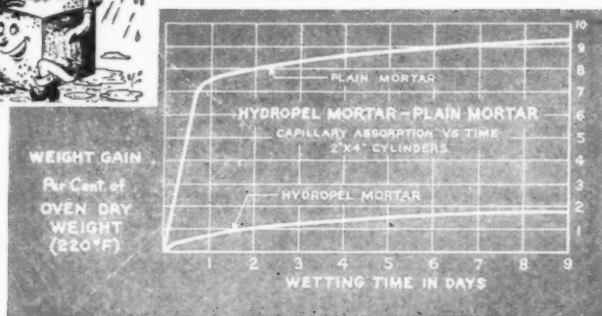


The rebound of steel balls shows how Hydropol "Comfort" Concrete absorbs impact. Humans and animals like its resilience and dry warmth.

(Photo—courtesy John B. Pierce Foundation.)



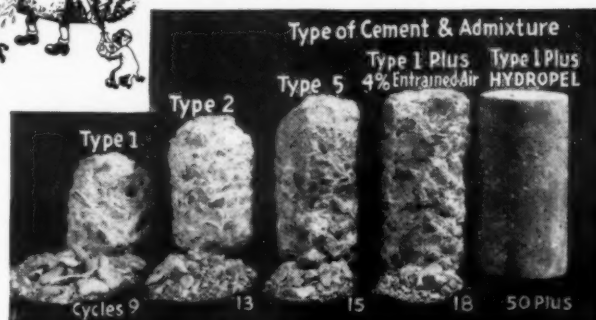
IMPERMEABILITY (Water Resistance)



Note that Hydropol Concrete shows a water absorption of only 15% compared with untreated concrete. Absorption with Hydropol is less than 1/3 that of any other "waterproofing" additive. Hydropol Concrete is now used for hydraulic structures.



Resists CHEMICALS (Solids—Liquids—Gases)



Hydropol Concrete gives superb protection against alkali salts. Over 50 cycles in the salt soundness test do NOT damage Hydropol cylinders—all others fail in relatively few cycles. Chemical plants prefer Hydropol Concrete.

HYDROPEL, perfected in over ten years of engineering research, offers you many exclusive advantages. Try it on a "tough" job NOW.



In the West
STANCAL ASPHALT & BITUMULS COMPANY
200 BUSH STREET • SAN FRANCISCO 4, CALIF.
Los Angeles 14, Calif. • Oakland 1, Calif. • Portland 4, Ore. • Tucson, Ariz.

In the East
AMERICAN BITUMULS COMPANY
200 BUSH STREET • SAN FRANCISCO 4, CALIF.
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Columbus 15, O. • St. Louis 7, Mo. • Baton Rouge 2, La.
E. Providence 14, R. I. • San Juan 23, Puerto Rico

Ask for our BITUMULS BOOKLETS. They are factual, illustrated, and helpful—a valuable addition to your engineering library.

- Bitumuls Penetration Macadam . . . ☐
- Bitumuls for Maintenance . . . ☐
- Bitumuls Sand-Mix . . . ☐
- Bitumuls Handbook . . . ☐
- Hydropol—Admix for concrete . . . ☐
- Tennis Courts—Laykold & Grosstex . . . ☐
- Fibrecoat—roof and metal coating . . . ☐

a "10-TON ROLLER" that weighs only 230 lbs. ...

Super-tamps, finishes, cures 60 to 80 sq. ft. per minute of bituminous or dry concrete pavement patching, mastic or cement composition floor base, or earth. Works flush to walls, curbs, tracks, manholes.

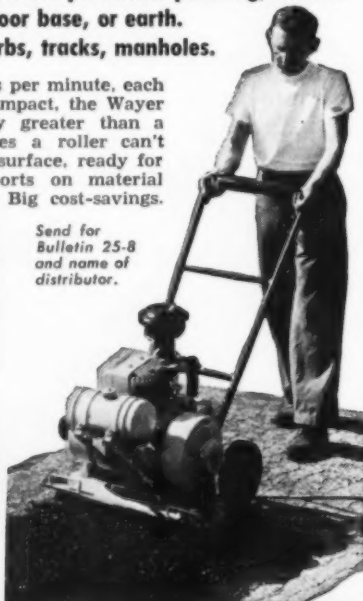
Striking 1750 to 2000 blows per minute, each of more than 700 ft. lbs. impact, the Wayer Impactor produces density greater than a 10-ton roller and in places a roller can't reach. Heated plate cures surface, ready for immediate traffic. Transports on material truck. One man operates. Big cost-savings.



Can work flush to any edge



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WAYER IMPACTOR

Wayer Impactor Sales Co., 12 N. Third St., Columbus 15, Ohio

A MIXER BUILT FOR Asphalt!

YOU can't mix asphalt like concrete. It takes better equipment to accurately proportion and mix asphalt.

The Foote Kinetic Mixer is especially designed and built for asphalt, and is not comparable in any way with the ordinary concrete mixer.

It provides a mulling action. Asphalt is pumped between and within the aggregate layers assuring complete coating of every particle of aggregate without waste of asphalt. This means 8 to 10 batches more out of every barrel of asphalt. Capacity is 3 cu. ft. in 30 seconds.

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the **FOOTE**
Kinetic
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THE FOOTE CO., INC.

Subsidiary of Blaw-Knox Co.

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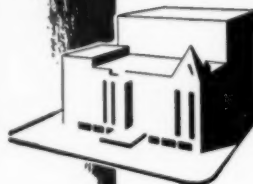
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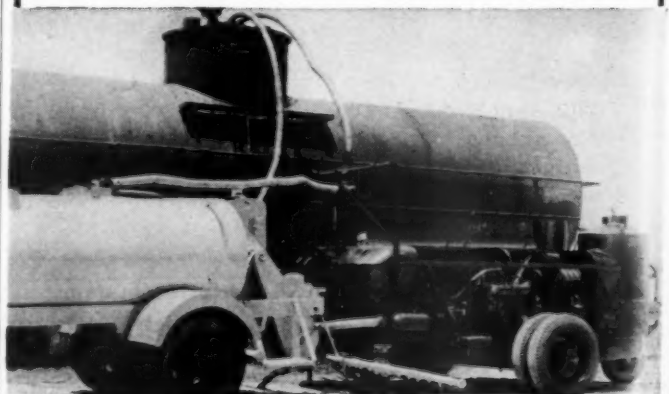


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into old, narrow roads with
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shoulders

Narrow pavements flanked by soft, rutted or gullied shoulders are hazardous. As many construction and maintenance engineers have found, the economical way to make such roads safe is to pave the shoulders with soil-cement.

Soil-cement hardens these shoulders, thus providing a firm extra width of pavement onto which cars may turn safely to avoid collisions or to make emergency repairs.

Shoulders paved with durable, all-weather soil-cement are stable the year around. They neither soften in spring freezing and thawing cycles nor wash away or rut in rainy seasons.

Soil-cement shoulders prevent rutting along the pavement edges, thus ending a major driving

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Paving shoulders with soil-cement makes roads safe quickly, easily and economically. Roadside soil constitutes about 90 per cent of required materials. Usually only portland cement and water need be brought to the job. Needed machinery is readily available and paving is fast and easy.

Investigate this simple, inexpensive way of making narrow roads safe. Write for free literature. Distributed only in the U. S. and Canada.

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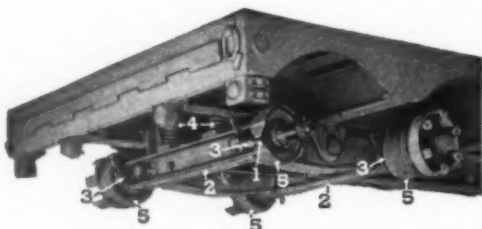
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A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

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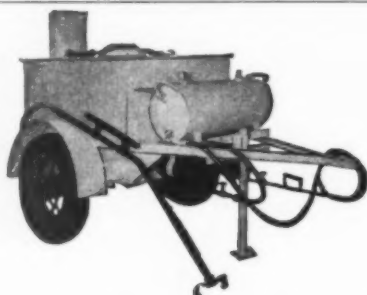
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Cut-back and other highly inflammable material used in street and road repairs can be heated with full safety in White kettles. FIRE-PROOF top reduces fire hazard. White asphalt and tar kettles are extensively used. They are highly satisfactory and give long life.

Furnished as plain kettles, or with hand or engine-driven spray pumps for patching all kinds of pavement. Can be supplied with thermometer, barrel hoist, warming hood. All oil burning. Mounted on semi-elliptic springs and pneumatic tires. 65, 110, 165, 220, 300 gallon capacities. Detachable fuel tanks.

Model F-10 is oil jacketed for safely heating elastic joint and crack filler.

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Owen Type DX Extra Heavy Duty Buckets are ideally suited for under water dredging operations. Sealed, grit-proof bearings are impervious to water and abrasive materials. Proper shell curvatures assure complete and rapid discharge of wet, sticky clay and sludge.

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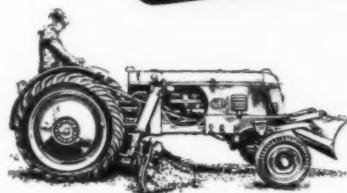
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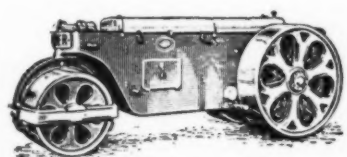
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You'll do a better job for less money with Huber Tandem Rollers. The variable weight advantage takes care of more jobs for a smaller investment . . . with its speed and maneuverability it covers more jobs . . . and fluid coupling drive makes all working parts last longer. This coupling protects the mechanism in either forward or reverse. It allows the engine to deliver full torque regardless of the speed of the roller. For final compaction, the ability of fluid coupling to absorb continual reversing shock reduces "scuffing" of the road bed and assures a smoother job.

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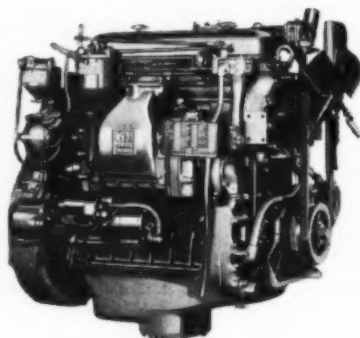


"They don't come any better."

Says Master Mechanic Ralph Stinson of Missouri Valley Construction Co.

MEN who really know—men, like Ralph Stinson, who have seen General Motors Series 71 Diesels at work—offer proof of their performance: "They hold up better and are easier to maintain than any other Diesel engine in the same horsepower range. They don't come any better," Mr. Stinson says. And he cites his records to back up his statement:

In the summer of 1946, Missouri Valley Construction Co. replaced three 3-ton dump trucks with a pair of Koehring Dumpsters, powered by GM 4-71 Diesels. Since then, the two units, now quarrying limestone at Warren, Mont., have tripled production with lower fuel costs. Maintenance has been considerably lower too,



Mr. Stinson reports.

General Motors Series 71 Diesel engines are designed to produce more power at lower cost. Their sturdy two-cycle operation delivers power at every piston downstroke—smooth, dependable power that responds instantly to varying load demands. They're sensible in size and weight, and compact construction makes them easy to install.

Simplified design makes service and maintenance much easier.

All these features combine to make your operation easier and more profitable. It will pay you to investigate the possibilities. Get the complete story from your nearest distributor or write to us.

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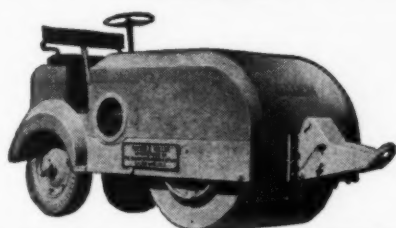
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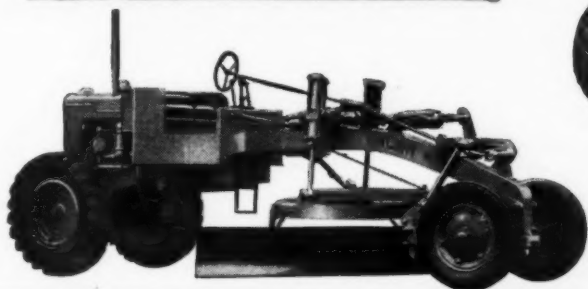
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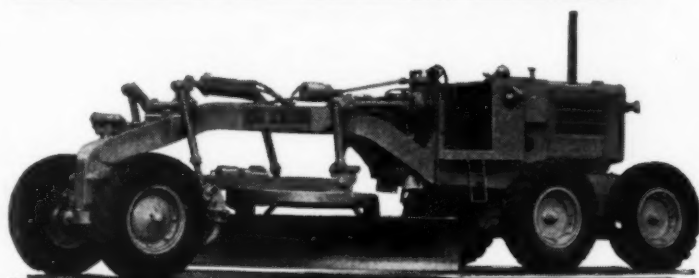
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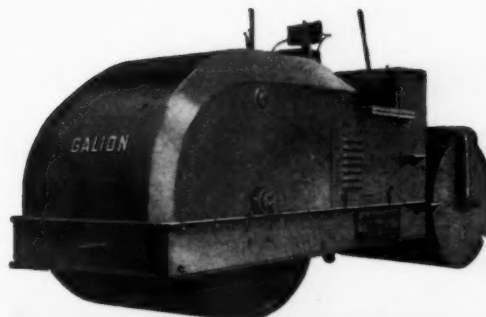
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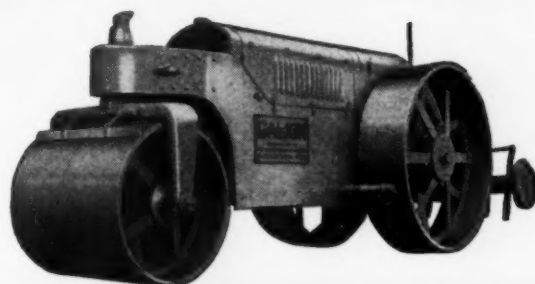
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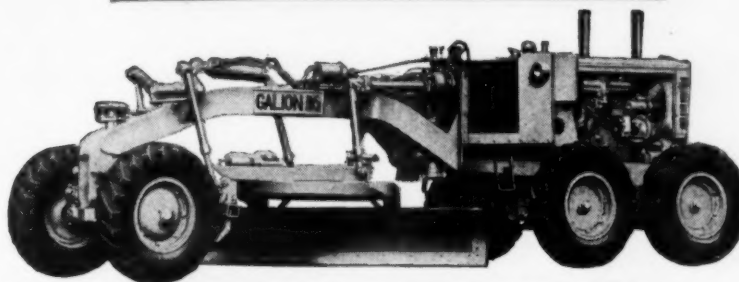
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TANDEM ROLLERS, Four Sizes—
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THREE-WHEEL ROLLERS, Five sizes—
6, 7, 8, 10 and 12 tons.



NO. 116 MOTOR GRADER, 100 H. P.
for Extra Heavy-Duty Service.

In the heavy construction field -- among contractors, engineers, and users who know equipment best -- GALION Graders and Rollers have long been regarded as being tops in performance, dependability, and profitable service.

Write for literature on the type of equipment in which you are interested -- and the name of nearest Distributor.

THE GALION IRON WORKS & MFG. CO.

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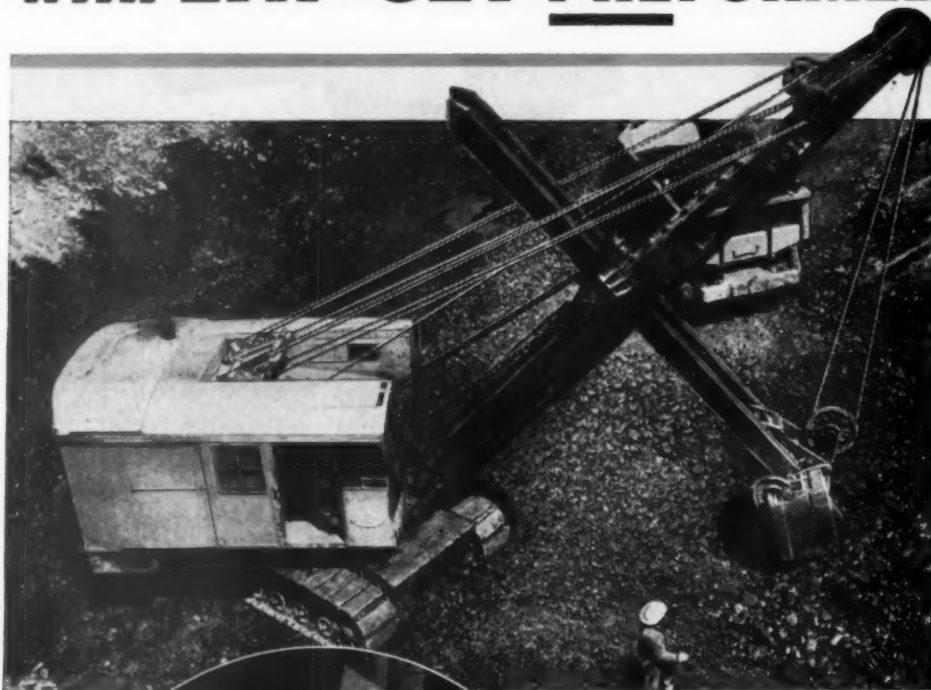
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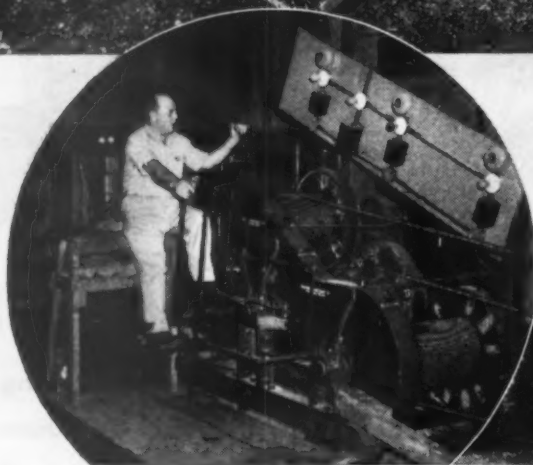
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Improved Performance with **LAY-SET** PREFORMED

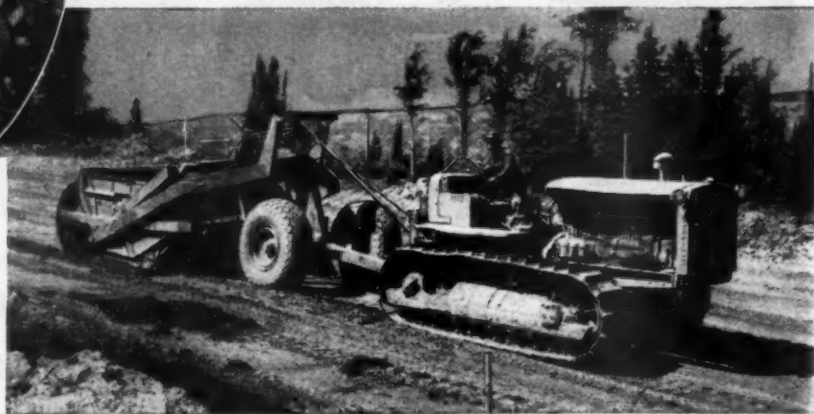


In strip mining costs are figured on a "per-ton" basis. The faster the overburden is handled and the coal or minerals speeded to market, the more profit "per-ton." Dependable wire rope helps lower costs because there are fewer shut-downs. LAY-SET Preformed's improved performance makes it dependable . . . and a favorite wire rope of strip operators everywhere.



Holists on construction jobs require safe, dependable wire rope because a single line is used to lift materials—and men. Here's a job for LAY-SET Preformed, the Green Strand Wire Rope with improved plow steel wires. It has great strength and flexibility. It means improved performance.

Building roads and dams is another use of wire rope where LAY-SET Preformed gives improved performance. Hazard's Streamlined Scraper Cable was designed for this tough service. It stands shock loads and lasts longer bending around small sheaves.



For every wire rope use—in mining, industrial, contracting—there are HAZARD Wire Ropes that will improve performance. And there is a HAZARD distributor near you who can supply your needs. Call him today for full information.

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In Business for Your Safety



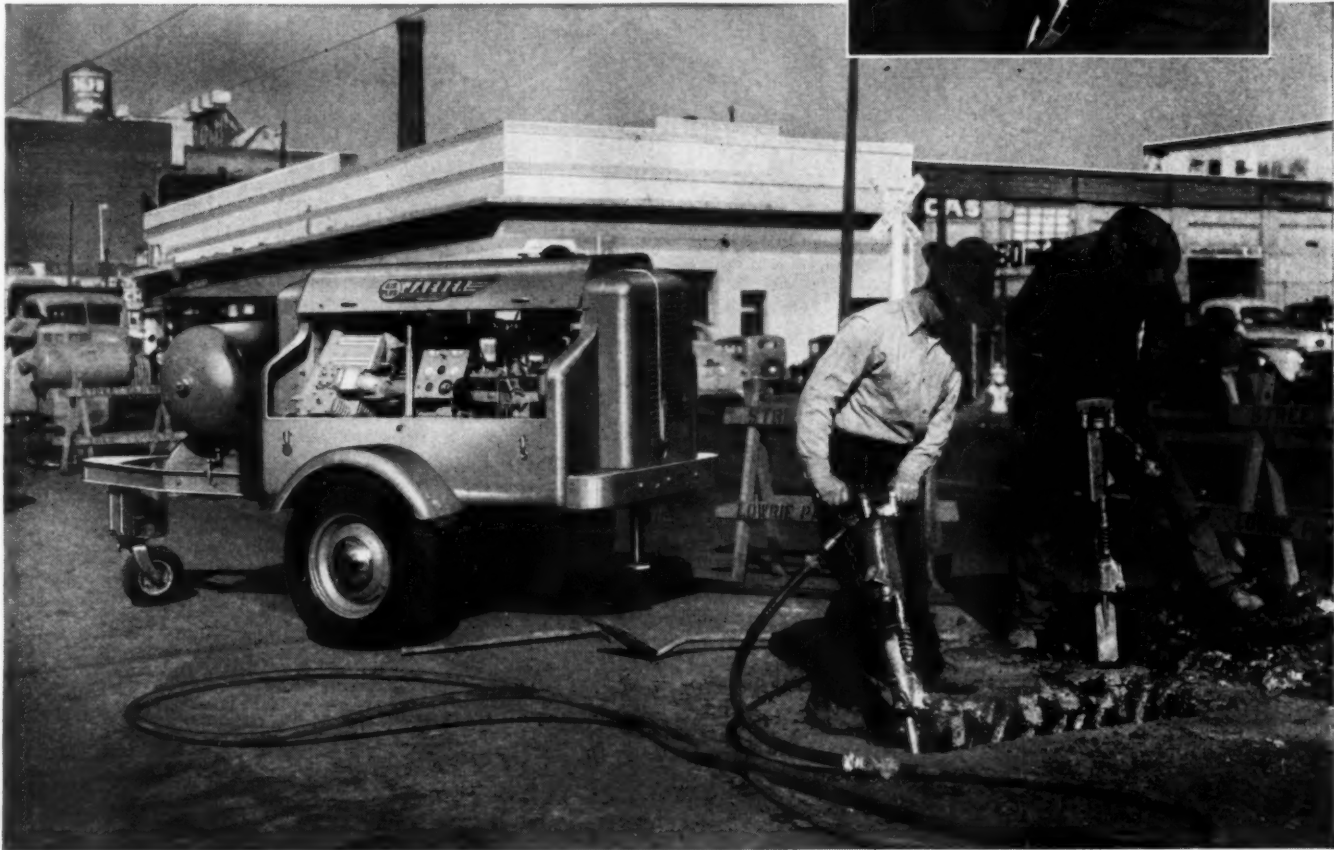
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**Wouldn't YOU look
happy getting out
4 days' work in 3?**



Lowrie Paving Company, leading paving and underground contractors in the San Francisco area, have found that their Jaeger "new standard" Model 125 Compressors will each operate two 35# breakers at continuous peak performance, thereby breaking as much as 40% more pavement than they were able to do with previous model machines.

"We are doing as much work in 3 days with the new standard 125 as we did in 4 days with 105 ft. machines" says Jim Lowrie, who now has a fleet of 5 Jaegers in continuous operation.

Leading distributors in 130 cities of the U.S. and Canada sell, rent and service Jaeger equipment.

You can get a comparable increase in production with any "new standard" Jaeger Air Plus. From the Model 75 that holds full 90 lbs. pressure in a heavy pavement breaker, up to the Model 600 that runs 2 heavy wagon drills at full 90 lbs., every Air Plus rating is matched to today's tools, not the tools used in 1932 when 60 to 500 ft. of air was enough. Ask your Jaeger distributor to prove this on your own job.

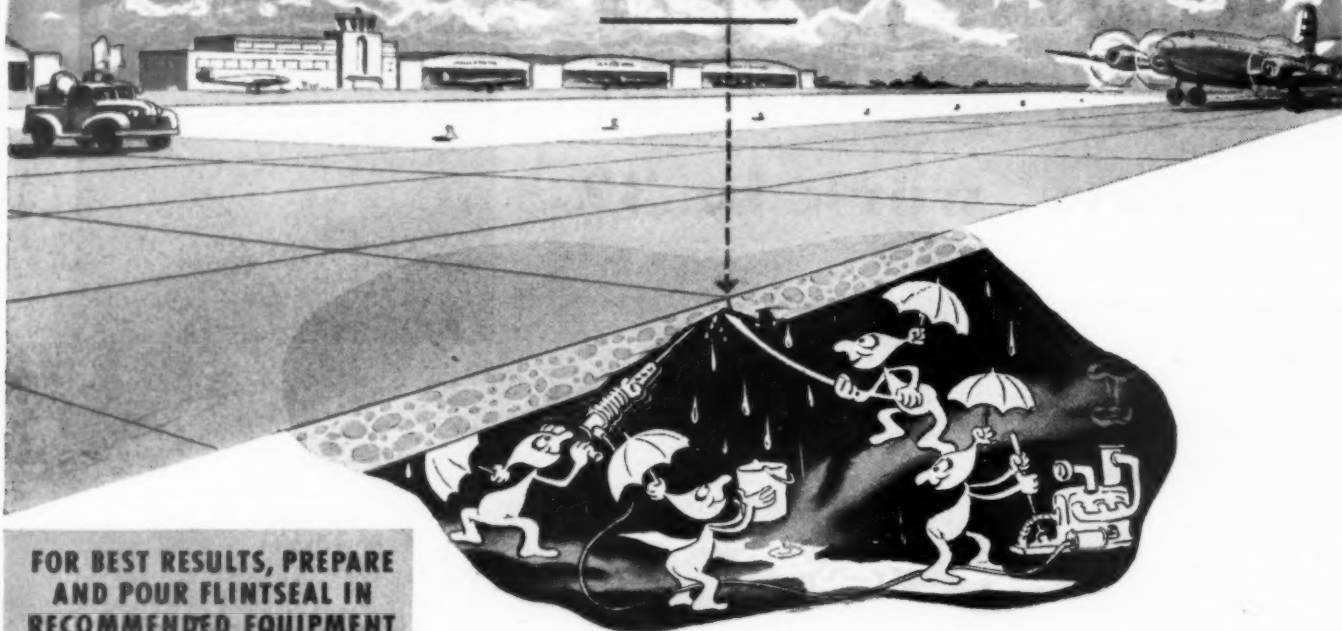
Note: Because of "Fuel Miser" speed control, Jaegers use no more fuel than others when not delivering more air.
THE JAEGER MACHINE CO., Columbus 16, Ohio



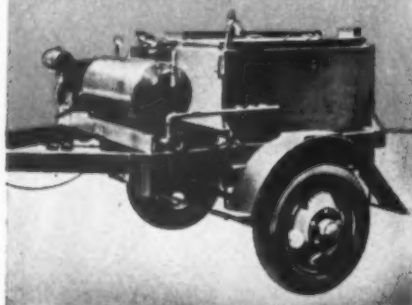
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engineered equipment

COMPRESSORS • DIAGONAL SCREED FINISHERS
SCREW SPREADERS • BITUMINOUS PAVERS

Don't Let It Rain Under Your Pavement



**FOR BEST RESULTS, PREPARE
AND POUR FLINTSEAL IN
RECOMMENDED EQUIPMENT**



One of the specially designed melting kettles used with Flintseal on large jobs.



This recently developed portable kettle is ideally suited to prepare the small amounts of Flintseal necessary for sealing industrial floors, steps, stadia, swimming pools, driveways, roofs and the like.



A special tool to fill and wipe the joint means that you'll get a clean, neat job with this type pouring pot. Circulating hot oil bath in the jacketed kettle keeps Flintseal at proper pouring temperature.

Moisture and other foreign matter...infiltrating at the joint...play havoc with pavement. Get Positive protection with FLINTSEAL.

Here's a short cut to long life and low maintenance for highways, airport runways and other concrete pavement: *protect each and every joint with Flintseal.**

You'll get a smooth, neat joint that *far* outlasts old-fashioned materials. And you get a trouble-free, *positive* seal.

Why? Because Flintseal *stays* resilient. It won't flow . . . even in hottest weather. It won't become brittle and crack . . . even on the

coldest days. As a result, Flintseal forms a tight, lasting bond to concrete that maintains a *positive* seal throughout repeated cycles of expansion and contraction of the slab.

Complete information and application data on Flintseal are yours for the asking. Write, today, for your *free* copy of our latest folder on this modern, rubber-bearing, thermoplastic joint-sealing compound.

THE FLINTKOTE COMPANY, Industrial Products Division
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

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It's the
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DIESEL POWER WITH ELECTRIC
 SWING AND AIR CONTROL

*It has what
 it takes to
 get big jobs
 done quickly!*



IT'S FAST! IT'S POWERFUL! IT'S ECONOMICAL!

Put this husky $3\frac{1}{2}$ -4 cubic yard machine to work on your toughest construction jobs. The MARION 111-M is setting production records across the country. It's a blend of speed,

power and economy that gets big jobs done quickly. Delivery dates?—earlier than you might think. Why not check your nearest MARION District office or agent today?

NEW — The MARION 111-M is now available as an all-electric machine with full Ward-Leonard Control.



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Proven Performance On The Job!



T2 TRAXCAVATOR on road widening job in Walnut Creek, Cal. Smallest size in the TRAXCAVATOR family—powered by "Caterpillar" D2 tractor.



T4 TRAXCAVATOR on "Caterpillar" D4 tractor street grading in Orlando, Fla. Note amount of dirt bucket is pushing ahead and easily handles.



T6 TRAXCAVATOR loading "fill" material on Toronto, Ont., Can. project. The power in the "Caterpillar" D6 insures ample digging and loading push.



T7 TRAXCAVATOR helping to convert Madison, Wis., street into super highway. This biggest TRAXCAVATOR in the line is on a "Caterpillar" D7.

There's a correct size TRAXCAVATOR for every job and purpose. See your TRACKSON-"Caterpillar" dealer for detailed information or write to TRACKSON COMPANY, Dept. RS-69, Milwaukee 1, Wis.

TRAXCAVATOR

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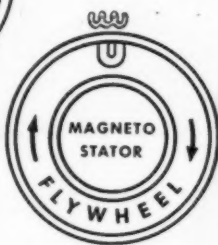
The Original Tractor Excavator

Here's Why McCULLOCH Saws start fast... and cut fast

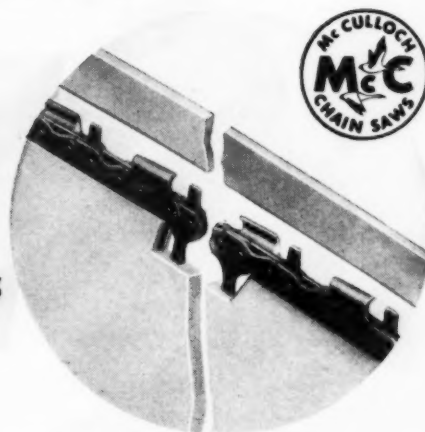


Conventional magneto, with coil inside flywheel, gives less spark at low speeds.

McCulloch magneto gives hotter spark at low speed. Magnetic lines of force are broken faster, because of higher rim speed at a given cranking rpm.



THESE FEATURES
SAVE TIME
IN LAND CLEARING
& CONSTRUCTION JOBS



they start fast

The sketch shows how the McCulloch magneto differs from the conventional type. At any given cranking speed, magnetic lines of force are broken faster, giving a hotter spark at low speeds. The hotter spark means faster starting, in theory and in fact. Ask any operator of a McCulloch saw about time saved by instant starting.







they cut fast

The special curved teeth of the McCulloch Rip-Cross chain, driven by 5 honest hp, actually scoop out the wood—with or against the grain or at any angle, in any kind of hard or soft wood. And here's another important time-saver: the Rip-Cross chain teeth have *no* critical wear points; the entire leading edge of every tooth *cuts*. With wear distributed this way, teeth stay sharp longer. Moreover, an unskilled operator can sharpen the Rip-Cross chain by hand filing without removal from the saw.



The 20-inch saw with its weight of only 49 lbs. and full-swivel blade, can be easily operated in any position by one man.

6 MODELS AVAILABLE—ALL INTERCHANGEABLE

	
20-inch Chain Saw...\$385.00	50-inch Chain Saw...\$415.00
	
30-inch Chain Saw...\$395.00	60-inch Chain Saw...\$425.00
	
40-inch Chain Saw...\$405.00	20-inch Bow Saw \$425.00

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McCULLOCH MOTORS Corporation

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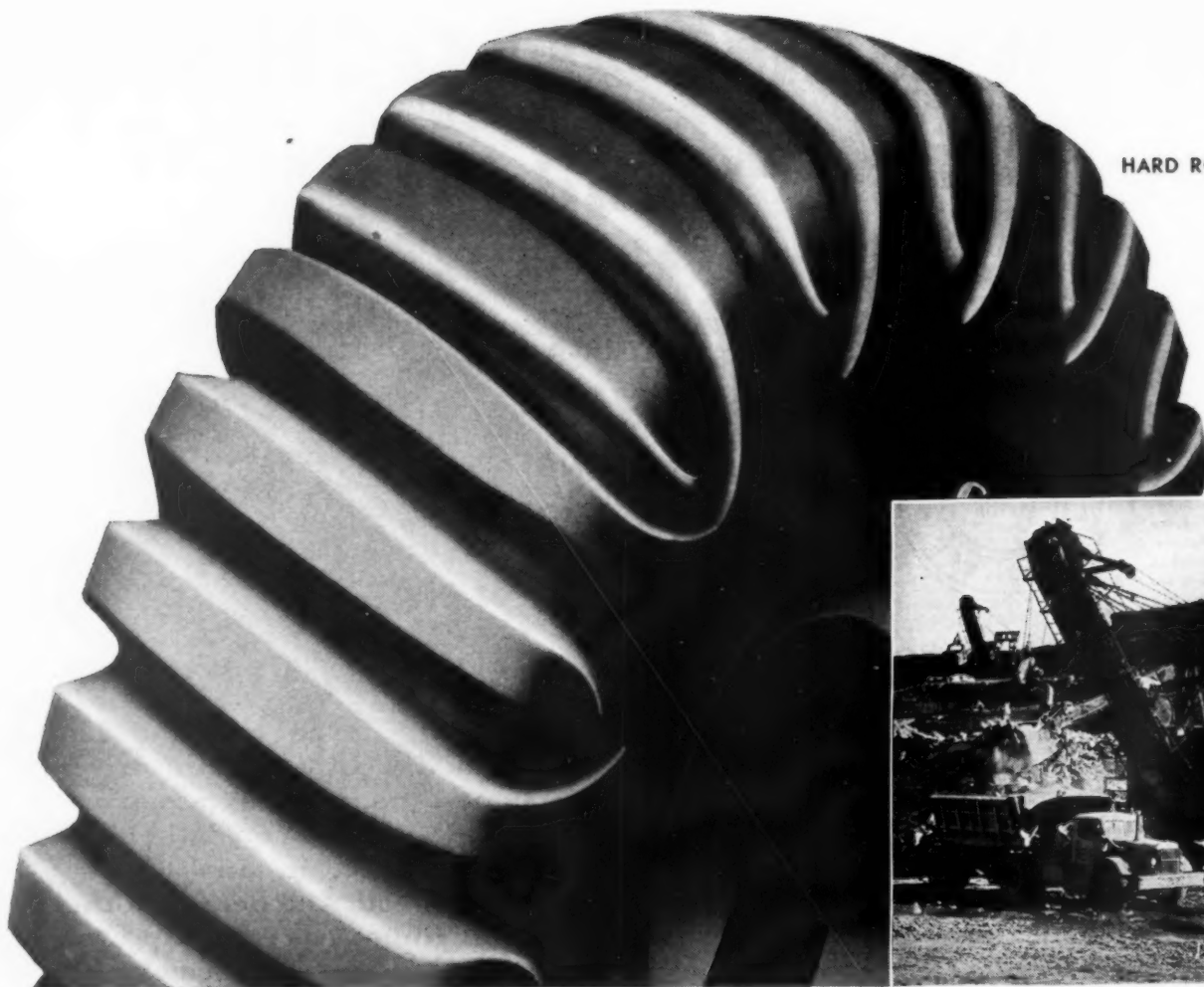
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Please send complete information on the 5-hp McCulloch chain saw and name of nearest dealer.

Name

Firm name Type of work

Address City State



HARD ROCK LUG

SO TOUGH you can't beat it!

HERE's the tire that's unbeaten for service on tire-ripping, tire-bruising jobs off the road. Goodyear's Hard Rock Lug is job-tailored to stand up against the roughest operating conditions. Its massive lug bars armor tread and sidewalls against cuts—its extra-thick undertread protects the carcass against bruises — its self-cleaning universal tread has equal pulling power, in

either forward or reverse.

The Hard Rock Lug is first choice of haulers for low-cost, long-life performance under the most rugged conditions. Try it on your toughest jobs and you'll discover one more reason why, year after year, *more yards are moved on Goodyear off-the-road tires than on any other kind.* Remember, always **BUY** and **SPECIFY** Goodyear—it pays!



GOODYEAR
has the right tire
for every job!



**EARTH MOVER
SURE-GRIP**

for maximum traction
on drive wheels

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for drawn vehicles and
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ROAD

Construction Accidents Are Costly

This article ably presents the case for greater attention to worker safety as a cold business proposition

By George W. Grupp

THE direct, indirect and subsequent costs of work injuries in the construction industry amount to millions of dollars each year. In fact, the ultimate economic loss of the 1948 work injuries of the construction industry will be in excess of \$400,000,000.

About 8.83% of the total 1,960,000 work injuries for all industries in 1948 were allocated to the construction industry by the United States Bureau of Labor Statistics. These 173,100 construction industry work injuries resulted in a loss of 3,808,000 man-days.

The future effect of the deaths and permanent physical impairments from 1948 construction work injuries may ultimately result in an economic loss of 15,000,000 man-days.

These figures, while they indicate a serious economic loss, are not exceptional for historically the work injuries of the construction industry is normally 2 to 3 times that of manufacturing. The only comparable industries are foundrying, lumbering, mining, quarrying, stevedoring, and wood-working.

Before proceeding further it should be stated that the chief purpose of this article is not to present a detailed analysis of such factors as (1) accident sources and causes, (2) labor-management safety responsibility, (3) safety inspection methods, (4) job safety analysis, (5) accident investigation procedures, (6) safety program methods, and (7) the psychology of accidents and safety. Instead these factors may be only lightly touched upon in dealing with the economic losses due to construction accidents.

It should also be stated at this time that since available statistics on accident costs are incomplete and unsatisfactory an element of error is

always present. But eventually such cost figures will become more accurate and complete when all members of the construction industry become more fully aware of the importance of such data as an aid in their efforts to reduce work injuries, to reduce insurance rates, to decrease the overall direct and indirect costs, to increase profits, and to enhance competitive bidding ability.

Program's the Thing

In studying this problem one must not forget that some degree of hazard is present in all forms of human ac-

tion. But eventually such cost figures will become more accurate and complete when all members of the construction industry become more fully aware of the importance of such data as an aid in their efforts to reduce work injuries, to reduce insurance rates, to decrease the overall direct and indirect costs, to increase profits, and to enhance competitive bidding ability.

manent disability in the construction industry are (1) hazardous arrangement of construction equipment, (2) faulty methods of procedure, (3) improper guarding of equipment, (4) workers' lack of knowledge or skill, (5) improper attitude of workers, and (6) workers' unnecessary exposure to danger.

The severity rate of accidents, or the frequency rate of accidents, is not the same in all branches of the construction industry, as can be seen from the accompanying chart.

And according to available statistics of the Army Corps of Engineers contract construction work the rate of injury frequency is considerably less than in similar non-Federal construction work.

Injury Frequency per Million Employee-Hours Worked

Year	Non-Federal Construction		Corps of Engineers Contract Construction	
	Bldg. Const.	Heavy Const.	Bldg. Const.	Heavy Const.
1941	41.8	68.0	24.3	33.5
1942	36.2	37.4	16.5	30.4
1943	25.4	24.5	13.6	17.7
1944	30.6	21.5	10.5	16.5
1945	30.9	28.1	8.6	15.0
1946	35.4	46.7	10.8	20.0
1947	38.7	41.8	14.5	19.8

tivity. Now in examining construction industry records one finds that work injuries are more often due to the lack of, or inattention to, safety programs than to the inherent hazards of the industry.

All accidents are the result of (a) human error, or (b) physical hazard, or (c) a combination of both.

The chief causes for death or per-

manent disability in the construction industry are (1) hazardous arrangement of construction equipment, (2) faulty methods of procedure, (3) improper guarding of equipment, (4) workers' lack of knowledge or skill, (5) improper attitude of workers, and (6) workers' unnecessary exposure to danger.

Good Progress Made

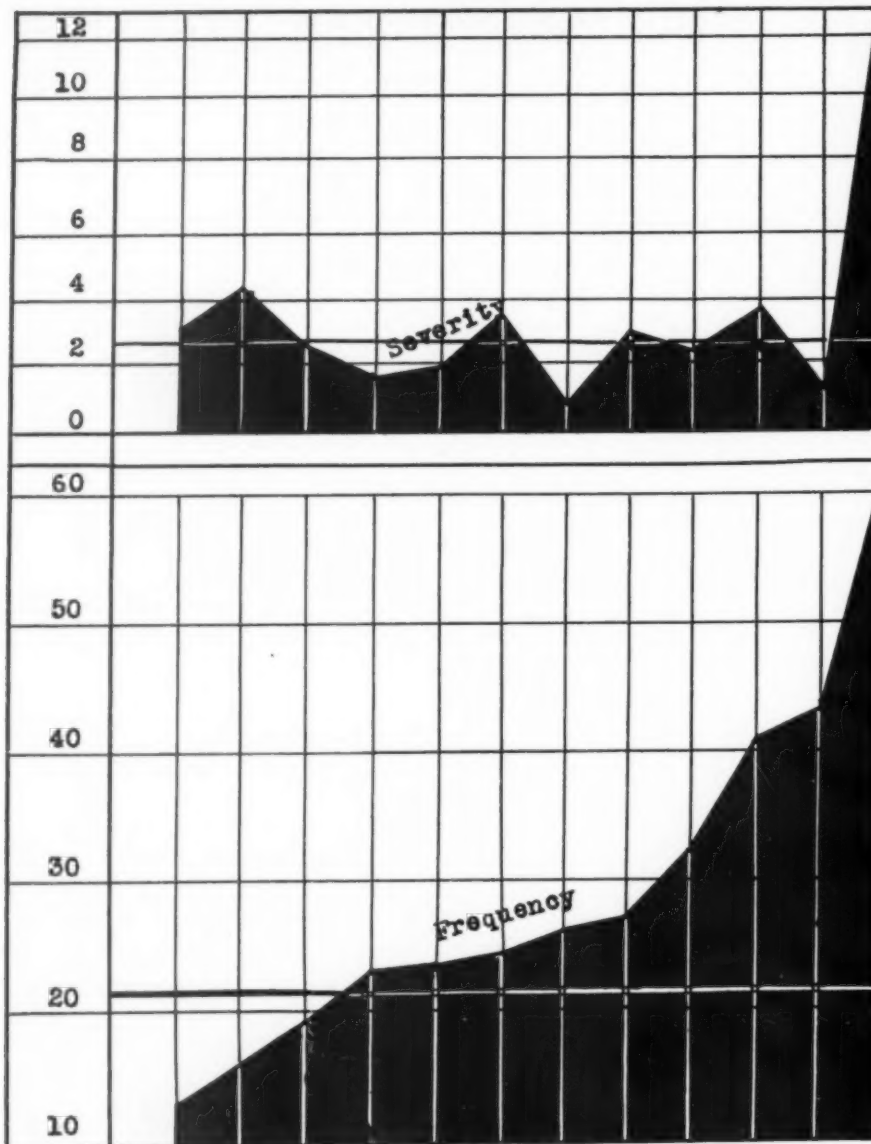
Of course the construction industry is making progress in reducing the number of work injuries. This may be observed from the chart showing the number of accidental deaths and disabilities per \$1,000,000 of new construction. The rate has steadily declined from 24.08 per \$1,000,000 of new construction in 1944 to 9.92 in 1948.

While this indicates a healthy attitude yet much more must be done to decrease human suffering, to reduce economic losses to workers, to contractors, and to society in general. Such losses are always reflected in the cost of living, in the cost of con-

The Effects of an Accident Prevention Program

- Reduces waste
- Reduces construction costs
- Improves morale of employees
- Increases construction progress
- Reduces workers' fear about health and safety

1945-1947 Average Frequency and Severity Rates



★ Severity average rate for entire industry 2.82 per 1,000 man-hours.
Frequency average rate for entire industry 21.34 per million man-hours

struction, and in the possible profits of contractors.

Most of the large contractors have reduced their number of work injuries, but small contractors have not made the same advances because they cannot afford full-time safety personnel, because they are not in the habit of attending safety congresses to learn about the importance of safety work, and because they lack a cost accounting system which enables them to realize their losses from work injuries. And since a large percentage of construction work is performed by small firms, even as subcontractors of large contractors, explains in part the present high rate of work injuries in the construction industry.

Contractors should not have any difficulty in ascertaining their direct accident costs for they concern them-

Vertical Lines in the Above Charts Refer to: [from left to right]

Rates
Marine Construction
Earth Dams
State Highway Departs.
Highway Construction
Construction Work, not Bldgs.
Unclassified
County Highway Departs.
Concrete Bridges, Dams, etc.
General Building Constr.
Public Utility Constr.
Tunnels and Subways
Struct. & Orna. Metal Work

selves chiefly with compensation insurance premiums, medical and dispensary expenses, and rehabilitation expenses.

Based on a study of 1,000 construction contractor accident cases, covering a period of ten years, it was found that the average direct work injury cost was about \$480 per case.

Typical Case Reports

In another study the National Safety Council found that the direct cost of work injuries for Contractor "A" amounted to \$2.33 per treatment as compared with \$2.13 per treatment for Contractor "B". Contractor "B" employed only a nurse, but Contractor "A" employed a doctor and nurse. A break-down of the direct costs of these contractors per dollar spent follows:

Item	Contractors "A"	"B"
Cost of worker's productive time lost	\$0.343	\$0.374
Dispensary personnel time cost	0.142	0.156
Medical supplies	0.154	0.169
Medical Department overhead	0.095	0.080
Dispensary administrative overhead	0.266	0.221
Total	\$1.00	\$1.00

Workman's compensation insurance rates are primarily affected by the contractor's work injury record, and by the amounts of compensation fixed by the various state laws. Each state places a different value on worker's physical functional losses, physical structural losses, and cosmetic disfigurement. For example, an index finger ranges in value from 28 weeks of compensation in the state of California to 61 weeks of compensation plus payments for temporary total disability in the state of Oregon.

An accompanying chart shows how one street construction contractor reduced his insurance rates and number of accidents by cooperating with the insurance company's safety program. The insurance rates dropped from \$2.60 to \$1.67.

Wide Variation Seen

In reflecting on the cost of failure to follow safety practices one insurance executive made this observation to the writer: "It is impossible to find contractors who either completely disregard all consideration of safety or contractors where every possible safety practice is followed. Within this range it is possible to find contractors with varying degrees of safety efforts. Their efforts will be reflected in the experience rates if the risk is of sufficient size. It is not unusual to find a range of 100% as representing the differential between contractors who do and do not observe safe practices. Those who disregard all consideration of safety do not say

Where Workers Are Hurt

Six-year average distribution of permanent partial disability injuries for the construction industry.

Hands	57%
Feet	13%
Eyes	9%
Legs	7%
Arms	6%
Ears	1%
All other	7%

in business very long.

High accident insurance rates increase the cost of construction; and high construction costs may tempt some to render inferior or defective workmanship.

Should one contractor reason that he will risk accidents and "skin the job" to make up for the losses due to accidents, the honest and safe builders are at a disadvantage in bidding.

On the other hand when owners award a construction contract to those with a flexible conscience they will awaken to find that they have defective structures on their hands.

Now all of this should not be taken lightly because accident costs and bank credits are always related. Reckless contractors soon find they cannot borrow money from the banks. And the owners of defectively built structures have difficulty in locating mortgagees to finance them.

To put part of this another way, if the cost of accidents and safety measures are not included in bid estimates, either the contractors will do inferior work or their profits will be reduced.

Big Hidden Costs

All contractors should know their direct accident costs, but very few of them know all of their indirect accident costs as indicated on the chart showing the construction industry accident cost factors, such as the time costs for arranging for other employees to continue the work of the injured workers, the damage costs of material spoiled by new employees in training, and by the stoppage of work of curious or sympathetic fellow-workers of the injured persons.

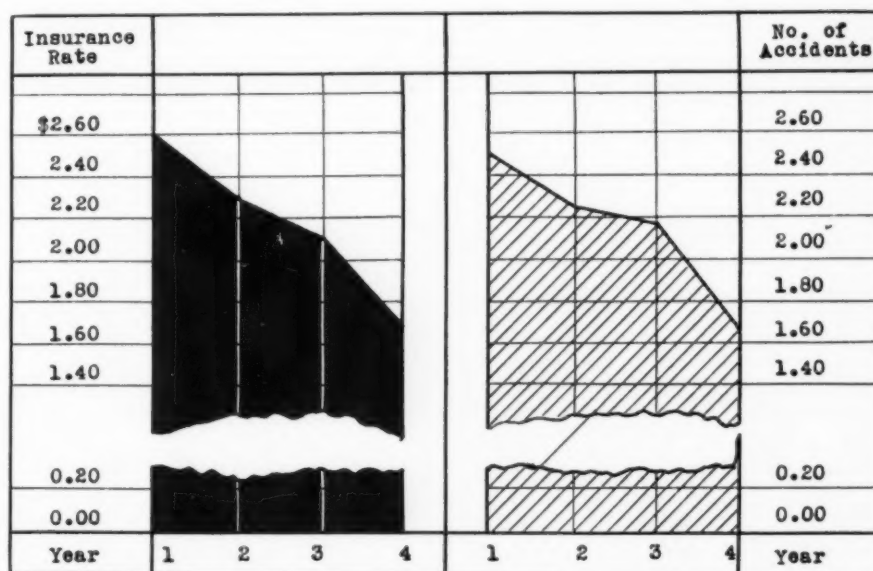
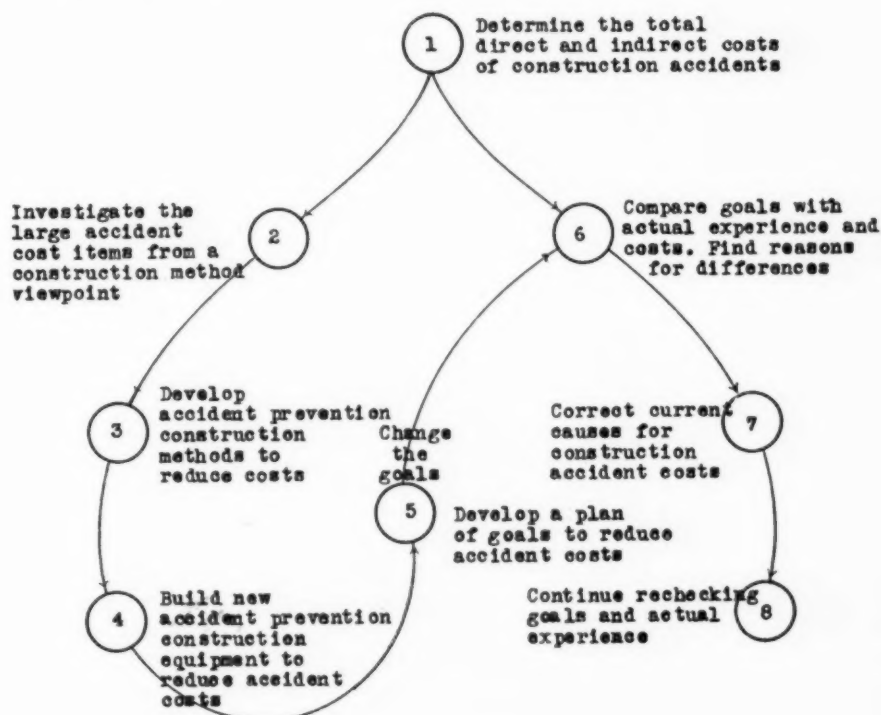
Some direct time costs of injured persons must be included under indirect costs because of the slowing up of construction progress while they are absent from the job to receive treatment at a doctor's office or the first aid dispensary.

When the construction industry makes an accurate study of all accident cost factors it should not be surprised to learn that the overall direct and indirect costs of work injuries, when translated into current annual rates, may be in excess of \$220,000,000 for 1944 accidents, and \$450,000,000 for 1948 accidents.

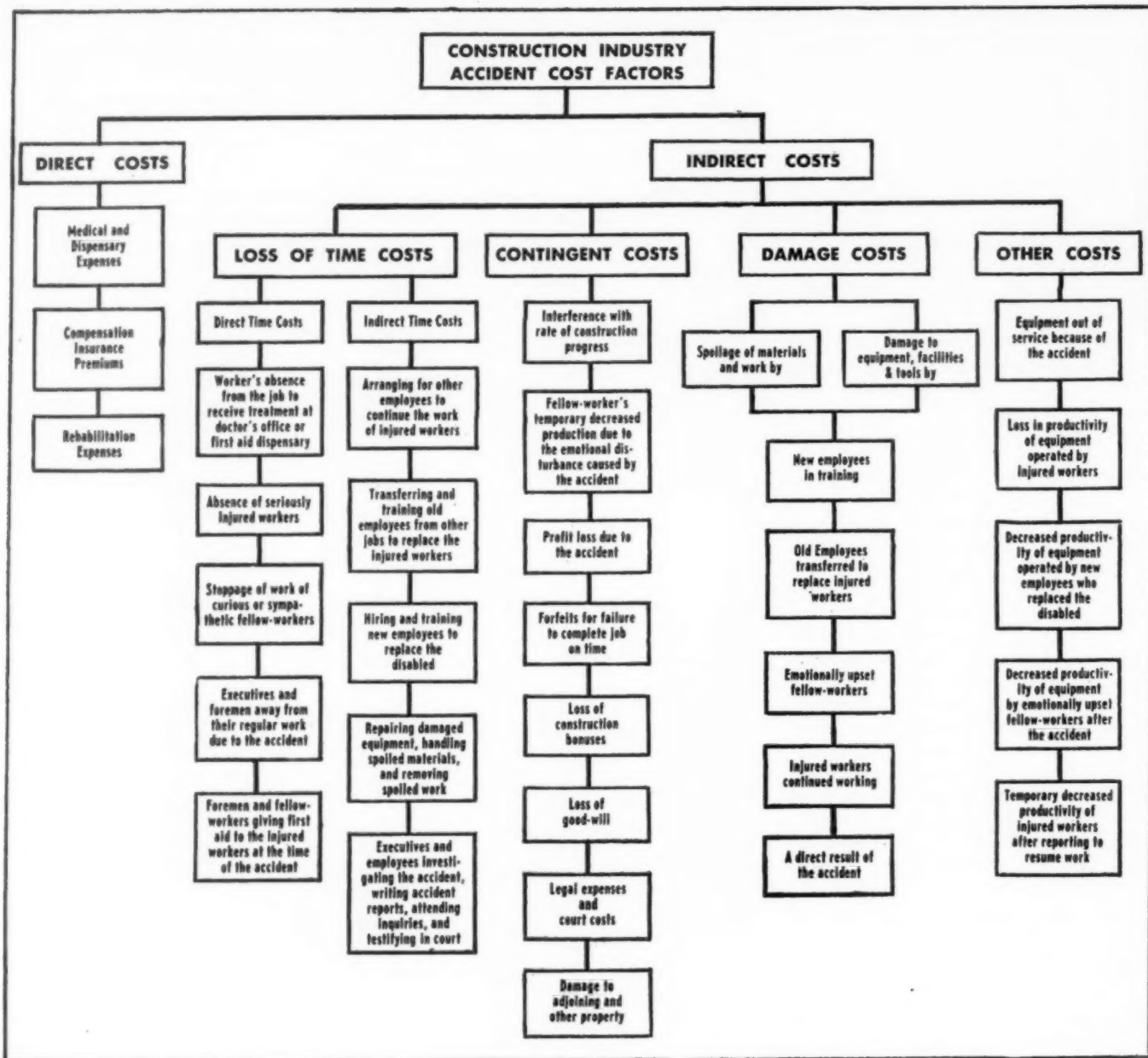
However, when these costs are con-

Year	Deaths	Permanent Total Disabilities	Permanent Partial Disabilities	Temporary Total Disabilities	Total
1944	0.27	0.02	0.87	22.92	24.08
1945	0.35	0.02	0.71	22.25	23.33
1946	0.21	0.03	0.32	12.04	12.60
1947	0.17	0.02	0.31	10.35	10.85
1948	0.14	0.02	0.27	9.37	9.80

★ Number of accidental deaths and disabilities of the construction industry per \$1,000,000 of new construction



★ How a street construction contractor reduced his insurance rates and number of accidents by cooperating with an insurance company's accident prevention program



sidered from another viewpoint it will be seen that the cost of work injuries per dollar of new construction has declined from \$0.0457 in

1944 to \$0.0258 in 1948.

But even though the cost per dollar of new construction has declined, the cost is still too high.



Construction industry accident prevention involves the recognition of hazards; the determination of probable hazards; the removal, isolation or control of hazards; and the usage of safety practices as indicated in the chart showing some of the elements of safety and accident prevention. In other words, only as accident prevention exertion is increased do accident losses decrease and profits increase.

No safety program is complete if it does not include methods of gaining the free-will compliance of workers. One should not forget that even one careless disinterested worker can make a whole job unsafe.

In other words, the safety program must include a stimulus which will promote (a) safety consciousness, (b) safety practice habits, and (c) good construction housekeeping.

(Continued on page 54)



★ The 15-unit caravan lined up just before leaving for Anchorage via the Alcan highway

Special Trailers

Built for Alaska Airport Job

A LONG 15-truck caravan wound its way into Anchorage, Alaska, several weeks ago to begin construction of a 5-million-dollar government airport. Contractors for the job are the Green Construction Co., Des Moines, and C. F. Lytle Co., Sioux City, who assembled a \$100,000 convoy, including specially-built trailer units.

In the past Green and Lytle would have built wooden shop, shower and kitchen units on the site. But because of high building costs in Alaska, they decided, many months ago, to build those mobile units to become a permanent part of their capital equipment.

Another element in their decision was time. It takes three to four weeks to erect wooden buildings and more to dismantle them. With the mobile units, clearing operations began immediately on April 1.

Four special trailers were constructed by Fruehauf Trailer Co., Des Moines. Two were 34-ft. shop trailers

which house tools and machines; one was an insulated shower unit trailer containing six separate showers and a wash basin trough, supplied by 100 gal. of hot water from an automatic heater; the fourth was an insulated kitchen unit to serve more than 225 workers on alternating shifts.

The kitchen unit contains an 11-ft. double oven and carries a 60-cu. ft. refrigerator, a 20-qt. baker's dough mixer, three basins for washing pots and pans. It is insulated with 1½ in. of fiber glass in the walls and has fluorescent lighting. Its water tank in the nose will carry about 750 gal.

For a mess-hall, a tent will be run flush against the huge side doors of the kitchen, where food will be served.

These mobile units will be valuable on future projects as well as on the airport job because they are so easily moved. All that's needed is to pull to a job site, unhook the trailer and you're in operation.

Seven "Semi-Dumps"

Seven of the caravan vehicles which traveled 4,200 miles up the Alcan highway in a little over two weeks are especially assembled "dump" semi-trailers. Drawn by Ford tractors, these are 16-ft. Trailmobile trailers fitted with 16-ft. dump bodies and 17-ton twin cylinder hoists by the Hawkeye Truck Equipment Co., Des Moines.

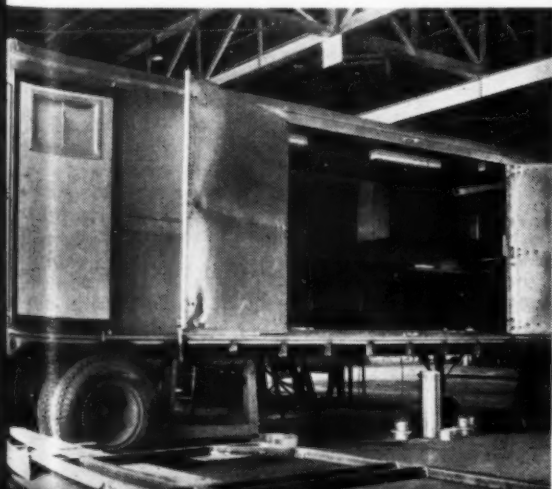
Other vehicles in the caravan were an ambulance, station wagon, and two other trucks.

Green and Lytle have been working on Alaskan projects since 1941. This new job will be called the Anchorage International Express airport when completed. It will have two runways, one 7,000 x 200 ft.; one 4,500 x 200 ft. Three million yards of dirt will have to be moved.

Only 19 men, including a foreman, accompanied the 15-unit convoy from Iowa. Most of the labor force was recruited from the Anchorage area.

★ Left: Side view of the kitchen unit with doors open. When pulled to a site, the trailer will be dug in and a tent mess hall run flush against the open doors. Capable of serving 225 workers on alternating shifts. Center: Interior of kitchen unit. Water tank in the nose of the trailer will hold 750 gallons. Right: The shower unit. Contains six showers for workers. Over 100 gallons hot water, warmed by automatic heater, is carried in the nose

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★ The Construction Industry Is the Gainer

Older men in roadbuilding, who remember the days when dirt was moved with mule teams, and a new-fangled tractor on crawlers was heard to be invented out west, are constantly amazed at the degree of mechanization that has occurred in the past three or four decades. A new reminder that heavy construction and roadbuilding have indeed grown up is gained by reading of one of the big new manufacturing plants recently completed to serve the industry. Described elsewhere in this issue, this plant will be studied with keen interest by industrial experts throughout the United States and the world because of its modern layout and efficiency design.

As we look down the long corridors of this factory we cannot help but glimpse one of the tractor engines in

our mind's eye as it leaves the plant. Having been born in the midst of a modern efficiency world of Rube Goldberg machines and tools, it is shipped out to some remote place where its owner must pit this engine and its tractor or other machine against mud and dust, heat and cold, the unknowns and uncertainties of construction work. Yes, and against human nature which still refuses to be perfect.

This factory is a reminder to contractors and highway officials everywhere that as better equipment comes along, it brings with it still greater responsibility to plan field work for utmost equipment utilization. The roadbuilder and road user are the real beneficiaries of better machinery production methods perfected behind the lines.

★ Engineered Safety vs. Driver Behavior

Much has been said vaguely and loosely about the need for better and more adequate highways as a means of making motor travel safer. The outstanding hazard of our highways and streets is their under-capacity for present traffic loads. But we'll go broke building the last accident out of the roads. On the other hand, what good is road design theory without a statistical knowledge of how drivers behave? Engineers have become increasingly aware that traffic consists of human beings at the wheel.

Writing under the title "Highway Safety—Key to Safe Highway Design" in *Public Roads*, PRA Commissioner Thomas H. MacDonald records the safety findings of many years of joint PRA staff effort. Highlights of this rather voluminous article include such conclusions as:

"We know that major reductions in the fatality rate can be made by providing properly designed modern highway facilities, as is evidenced by the records.

"Accidents are inevitable on overloaded highways. Safe highways must have sufficient capacity.

"The traffic rate for rural roads carrying less than 1,000 vehicles daily is only half that of roads carrying

over 8,000. The death rate on any 2-lane highway increases with the traffic.

"Sight distances of 1,500 to 2,000 ft. are essential on any rural 2-lane highway . . .

"Multi-lane highways of the divided type will carry three to six times as many vehicles as a 2-lane highway, with greater safety . . ."

The profession is indebted to the commissioner for a clarification of this subject. In his closing paragraphs he reminds us all again that a future reduction of highway fatalities will finally come only from building safer roads. While the driver's behavior must be the subject of continued research, it is time to cease putting enforcement emphasis on minor over-speed violations, but rather authorities must toughen up and go after the few drivers whose behavior is a constant menace. They should be ruled off the roads.

Taken to task are the enforcement officers who waste time on routine and futile checking of speed, overtime parking and other such detail work which clutters our courts and has little real bearing on the accident problem.

★ More Federal Aid Tinkering

It is always open season for sniping at the Federal-aid highway program. One of the most important elements of the present set-up is the fact that all highway aid must be administered through the state highway departments. Present pot shot activities are being

concentrated on changing this part of the law. As we go to press, according to an ARBA news report, the Senate committee on roads is holding hearings on S.1471, introduced by Senator Kerr of Oklahoma and S.244, introduced by Senator Stennis of Mississippi.

These bills are aimed at setting up a definite amount of money (150 million dollars in one instance and 100 million in the other) for the construction of rural roads, beginning with the 1950 fiscal year. This is OK. But the gimmick in both bills is that the Commissioner of Public Roads is authorized to cooperate with the states "and various local political subdivisions" in the construction of rural local roads. All standards of construction would be arrived at in each state by agreement between the state highway department and the local political subdivision.

Think what this means! If we don't watch out the already over-burdened state highway departments will be dealing with hundreds upon hundreds of local officials, including not only county road commissions but also police juries, township and village officials, local drainage boards and so on. Not a qualified engineer in a carload. It doesn't take much imagination to see what kind of a snarl our Federal-aid program would get into quickly under such a regime. The red tape would be terrific and the chances for federal engineers getting even sympathetically tough on design standards and programming matters would be nil. Even worse, around election time the whole business would turn into pure politics, if experience with federal-local set-

ups in other fields is any criterion.

Much local highway work still starts nowhere and gets nowhere, consisting largely of scratching the roads and fooling with the ditches and culverts each year. The proposal to deal directly with local people would not correct the chief evils inherent in thousands of small local governments, each of which is too poor to hire efficient engineers, and each too locally self-centered to join effectively into a state-wide program for up-grading the highway system and achieving route continuity. There is no assurance, either, that the federal investment would be protected by adequate maintenance.

These bills would not require the Public Roads Administration to be responsible for policies covering design, plans and construction standards, but rather places it in a consulting capacity. Federal funds could be spent without the cleansing benefits of public competitive bidding by private contractors. Inevitably this procedure would swell the already high total of funds being spent by political authorities in competition with free enterprise.

Every friend of local highway progress should help fight bills of this kind.

★ Hand Labor Still Challenges

Largest estimate by PRA shows that 51% of the cost of maintaining highways goes for hand labor.

This percentage has come down steadily, but is due for a further drop unless the WPA psychology hits the country again.

Even if these fellows who swing hand tools were willing to work for only a few cents an hour, their services would still cost too much compared to mechanical methods in many instances.

Thousands of men today are doing manual labor

along the highways that a machine ought to be doing, so that the seriously inadequate maintenance funds can be made to perform more work.

●
"When I was a young lieutenant I thought I could do better than any contractor, and today I admire that spirit, but not the judgment."—Major General Lytle Brown, late Chief of Engineers.

★ Editorial in the Chicago Tribune

HIGHWAY FRATE TRAINS AND RUINED ROADS

P. H. Bartlett, a Chicago manufacturer of highway trailers, asks in the Voice of the People why we keep lambasting trucks. He notes that we had a new press delivered by truck the other day, and takes this as evidence of our belated discovery of the usefulness of that vehicle.

As Mr. Bartlett also notes, we deliver newspapers by truck, and we get a variety of products at our own homes by truck. We know that most of the nation's goods are eventually handled by trucks—but light trucks, usually. We know all about truck safety records, and we have written editorials on the courtesy of highway truck drivers.

The only lambasting of the trucking industry that we have done is of that section of it for which Mr. Bartlett builds his big trailers. His assertion that it is political grafters and the weather that break up highways, not the smashing impact of mammoth highway frate trains,

is the standard story of the trucking industry's lobbyist. Every one outside the industry who has taken the trouble to investigate the facts knows that this is false.

This includes the engineers of our city street department and county highway department. It includes the state highway engineers of Illinois and other states, and of the federal roads administration, and the technical experts of the cement industry. They all say that it is the whacking of heavy trucks that destroys paving; that the present type of concrete road built in Illinois would last almost indefinitely if traffic were confined to passenger cars and light trucks.

Freezing, thawing and rain also damage highways, but in large measure only in co-operation with the big trucks. It may be that roads in such relatively frost-free states as California may stand heavier impacts than those in Illinois, but we're not paying taxes to build roads in California. We're paying to build them in Illinois.

The railroads discovered decades ago that they could handle frate more cheaply if they put on heavier locomotives and frate cars. They discovered at the same time that they had to spend a lot more money on better roadbed and heavier rails if they were to run their heavier trains.

When the trucking industry also discovered that heavier loads meant lower costs and higher profits, it stopped its expenditures with the purchase of the larger equipment. The industry expected all highway users to contribute to the building of the heavier rights of way that its vehicles alone make necessary.

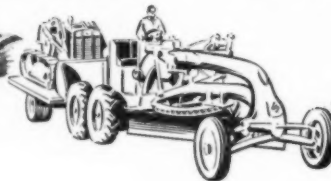
We have no grudge against the trucking industry. We recognize its usefulness and importance in the national economy. All we expect is that it pay taxes sufficient to build the heavier highways that its trucks and trailers require. It isn't doing that now. Roads in this and every other state are being wrecked as fast as they are built, and faster than they can be repaired, and it is the oversize trucks that are doing it.

HD-5 TRACTOR

HD-5 TRACTOR with Tracto-Shovel and its interchangeable attachments—1 cu. yd. standard bucket, $\frac{3}{4}$ cu. yd. narrow bucket, 2 cu. yd. snow loader bucket, 1 cu. yd. rock bucket, bucket teeth, heavy-duty bulldozer blades, V-type snowplow.

Wrap up

YOUR YEAR 'ROUND PROBLEMS *with this* EQUIPMENT PACKAGE



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removal and loading are quickly, efficiently done with this versatile combination—AT BIG SAVINGS. Let your Allis-Chalmers dealer tell you all about this LOW COST, BUDGET STRETCHING PLAN . . . NOW!



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Clean
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Widen
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Build b
Scarify
Backfill
Take ou
Remove
Load s
and diti
Remove
Make fil
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cu. yd.
bucket
yd. road
bulldoz



BD-3 MOTOR GRADER

BD-3 MOTOR GRADER, 78 brake h.p., 19,042 lbs. . . or any other A-C diesel-powered model—AD-4, 104 brake h.p., 22,140 lbs.; AD-3, 78 brake h.p., 21,835 lbs.; BD-2, 50.5 brake h.p., 17,772 lbs.

SOME OF THE JOBS YOU CAN DO WITH JUST THESE TWO MACHINES

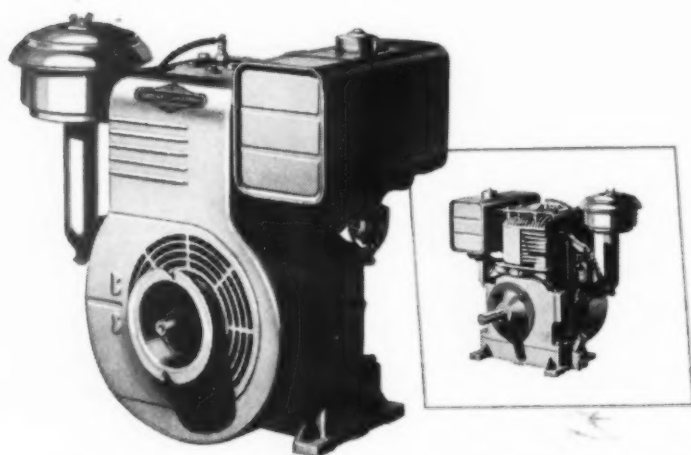
- Clean and shape-up ditches
- Cut and smooth backslopes
- Handle regular maintenance
- Widen and reshape roads
- Make driveways and bridge approaches
- Build berms
- Scarify roads and streets
- Backfill pipe, culverts, bridges
- Take out cuts
- Remove and load sod
- Load surplus dirt from shoulders and ditches
- Remove and load topsoil
- Make fills
- Handle bulldozing
- Make channel changes

- Plow, move and load snow from roads and streets, alleys, parking lots, cemeteries, institutions
- Skid trees
- Load rocks and stumps
- Dig and load dirt
- Load sand, gravel and other material
- Mix black-top
- Do crane work
- Handle all types of hauling or pulling
- Straighten out curves
- Open and rebuild alleys and streets
- Build parking lots
- Cut away embankments obstructing sight



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BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U.S.A.



Construction Accidents Are Costly

(Continued from page 48)

Workers Need to Share

Differences in results of a safety program should not surprise one for all human beings do not respond uniformly to the same stimulus because of their differences in (a) degrees of intelligence, (b) philosophies of life, and (c) types such as the emotional or phlegmatic types.

To obtain free-will compliance to a safety program the workers should be made to feel that they belong and that the objectives of the safety program are personally desirable. This means that the stimulus must get them to desire an outstanding safety record, to desire a willingness to cooperate and to serve others.

The stimulus should make the workers fear personal injury and pain. It should make them aware of the possible hardships to their families. It should point out to them the possible personal economic disaster through their loss of earning power.

The workers should be made to realize that accident prevention is a top-priority project which their employers consider an essential part of good construction practice.

Foremen should be reminded that they are responsible for the conduct of safety on jobs under their supervision, and that it is their duty to help workers develop an understanding of the right and safe way of doing things.

Workers should be told that whenever work injuries occur, no matter what their causes, the injured persons, their fellow-workers, their employers and society in general must each pay a portion of the cost.

Some workers may not be aware that an increase in accident costs contributes toward decreasing the purchasing power of a dollar. They may not know that accident costs aid in lowering the standard of living. And perhaps they do not know that work injury costs play a part in reducing the demand for goods and construction work.

To put this another way, a carefully executed sound construction safety program aids in reducing the nuisance of high level accident rates and threats to health. It improves the morale of employees. It reduces the cost of accidents to employees. It reduces the wastage of materials and time. It promotes new and better construction methods. It increases and speeds up the rate of construction progress. It reduces injury costs. It decreases construction costs, and it enhance the possibility of profits to contractors.



DIG *fast...*
DIG *deep...*
DIG *long!*

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keeps ditcher teeth
sharp, out-to-size,
on the job

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Drive sprockets and driving lugs on the bucket wheel are two other good bets for hard-facing. Simply weld a few ounces of Stoddy Self-Hardening to the pressure faces. It quickly restores tooth size and shape and generally doubles service life over similar unprotected parts.

Remember, there's a Stoddy Alloy for any wear problem involving abrasion, even when combined with impact, corrosion or heat.



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Equipment Problems Discussed at ARBA Savannah Meeting

Soils, concrete and bituminous problems covered. One session also given over to review of national sectional highway needs

Roads and Streets Staff Report

THREE hundred highway, airport and municipal engineers met at Savannah, Georgia, May 11-13, for another regional problems conference in the series which the American Road Builders' Association has staged periodically since the war.

As with previous meetings in San Francisco, Buffalo, Boston and elsewhere, the aim was to cover soils compaction, earth moving and paving procedures with special emphasis in the performance of present-day equipment and possible need for better equipment designs. Value of the meeting lay in getting contractors, engineers and equipment manufacturers together.

While ARBA is not a specification writing body, it has a unique opportunity to aid in the writing of suggested equipment specifications, one speaker noted again at Savannah. Specifications for many kinds of equipment are so varied among the states, counties and other specifying agencies, that difficult problems of supply are posed for manufacturers and distributors. Manufacturers often are unable to apply mass-production economics, and distributors have quite a time stocking all designs and types in the local yards for immediate delivery, as a result of the continued lack of standardization.

Specification Example

Specifications should be developed that will serve as general nation-wide guides. They should give general machine characteristics that will lead to improved performance, lower costs and eventually to wide adoption. An example of a wisely written specification that has resulted in great benefit to the industry was cited. Many years ago an ARBA committee developed a general requirement for concrete road forms, in cooperation with AASHTO. This document was kept general, requiring merely that forms be true with $\frac{1}{8}$ -in. tolerance vertically and $\frac{1}{4}$ -in. laterally. This one simple requirement now widely adopted, has done much to eliminate field arguments on thousands of jobs all over the country. It enables the inspector

quickly to decide if the contractor is complying, and thus removes an everyday problem from "whim decision."

Under chairmanship of E. A. Willis, senior highway engineer, PRA from Washington, J. B. Dunbar of Alabama, co-chairman, the first day was devoted to earth moving and compaction equipment matters. R. A. Harris, chief engineer, Mississippi, talked of southeastern problems. Mr. Willis prefaced discussion by reminding everyone to stop thinking of soil as dirt, but to give it the same consideration as any other material of construction. There is no substitute for sound engineering judgment in utilizing soils, and both theory and tests must be drawn on merely as aids to common sense application of the soils at hand, he noted.

Southeastern highway engineers have progressed far in procedures of predicting soils behavior. But many questions need further study, as for example why pavement heave still occurs in some places despite deep granular blankets over subgrade. Studies of concrete pavement pumping show that there is need for continued attention to methods of soils correction.

Clay vs. Stabilization

Some of the topics discussed are briefly noted as follows:

Clay soil in stabilization. No satisfactory equipment yet has been devised for pulverizing heavy clays for stabilization. The consensus is that the worst clays have no place in stabilization work.

Sandy soil compaction. Need was expressed for equipment that will compact A-3 soils. One manufacturer is said to be preparing to introduce a pneumatic roller capable of weight variation from 10 up to 40 tons, and experiments on eastern road projects have been made.

Greater mixing depth in stabilization. Lively interest was shown in the possible idea that stabilization can be carried out in thicker layers than now commonly specified. Equipment manufacturers seem hesitant to consider such equipment, due to specification problems and the admitted difficulty of properly compacting layers deeper than 6 in. in many soils.

Heavy equipment effect. As in past

ARBA meetings, warning was given that some soils after consolidation at optimum cannot carry today's heaviest equipment without disturbing compact layers. One northeastern state (New York) clearly labels plans for projects that are unsuitable for heavy equipment, so contractor will be forewarned.

Better boring and exploratory equipment. There is need for more specialized equipment that can do a faster job than the usual 2-in. diam. hand auger and go deeper. One state highway department especially asked for better rock drilling equipment for exploration down to 60 ft. Power soil augers are wanted for in-between depths.

Backfill tampers. Interest was shown in the expected appearance of new equipment for doing a faster job of tamping around culverts, at bridge ends, in trenches, etc.

Boring Equipment

The need is most felt for a better power auger. Boring and sampling needs have progressed to the point where old hand augers are outmoded, one delegate said, noting that such work is not a job for high school students on summer vacation but for highly trained personnel. Much test data are nearly worthless because samples are not taken in sufficient locations to be representative. More and better under-surface information is needed, and needed *before* the job gets to the design stage.

An ideal power auger, said one engineer, must be light and portable and must give representative samples. Some commercial units on the market come close, but none fit this speaker's conception entirely. Another suggested that equipment must be of heavy design, with plenty of engine and drilling power, yet able to be moved over rough terrain. No unit available today, for example, can bore down 30 ft. to where a future grade will be, then take a 12-in. sample and get it to the surface in good condition.

Sampling was admitted to be too costly ever to get all the data desired for largest and deepest cuts encountered today on road work.

Recommends Test Pits

The use of old-fashioned test pits is sometime overlooked, it was further suggested. Sometimes it is cheaper to take a small power shovel around and excavate open pits than to bore, especially where boulders and other obstacles are encountered. Test pits were reported to be widely used in connection with a state-wide materials survey just completed in Montana.

The concrete and bituminous paving sessions, which will be reported on more in detail at a later date, covered

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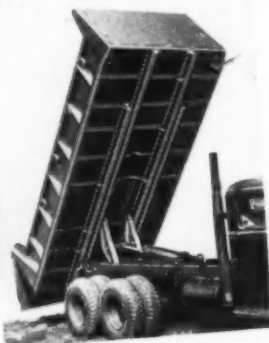


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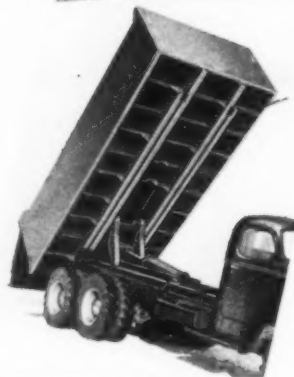
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a wide range of problems. Concrete road forms again came in for interested discussion, which centered on the need for greatest care in setting forms and joint hardware.

What to do with tie bars that need bending over was quite a question. Much tie bar breakage (in bending them over) has occurred, it was reported, but the use of structural steel has reduced this trouble. Specifications covering concrete road details are still far from standardized and as one manufacturer's representative noted perhaps it is too much to expect in our lifetime that all states will get together. New York state's tie bar specification, calling for use of a 2-piece dowel bar, was described. With this design the first half of the bar is held in place by a cap-screw in the lane form, and after concreting the cap-screw is removed and the second half of the bar screwed in place.

A concrete industry spokesman pointed to the "trend toward fewer expansion joints with more frequent contraction joints," and to simplification of concrete road design in the interest of economy.

At the asphalt session, also too lengthy to report in detail here, many constructive points were brought out. Need to train better operators of bituminous and other equipment was voiced by a Virginia delegate, who told of his state's training program. His chief point was that training effort must be centered on the supervisors or foremen.

Special interest was shown in the fine points of finisher operation (don't tinker with the leverage screws), dryer capacity and other phases of asphalt plant design, trends in asphalt grades, fine points of flat roller operation, and pressure distributors.

Focus on Road Needs

The conference was the occasion for a notable symposium on national and southeastern highway conditions and on the degree with which present rates of construction are keeping up with need. Under chairmanship of Charles M. Upham, engineer-director of ARBA, a panel included J. S. Bright, deputy commissioner of PRA; John J. Sparkman, acting chairman, U. S. Senate sub-committee on roads; A. E. Johnson, state highway engineer of Arkansas, and Col. E. R. Needles, consulting engineer, New York, who is president of ARBA. Sifted from the mass of statistics are three thoughts which this reporter leaves with the **ROADS AND STREETS** readers:

(1) American people spend 30 billion dollars a year on highway transportation. Ten percent of this—about \$3,000,000,000 annually—is now going for highways, as a means of making the other 90% of the picture possible.

(2) Again it was brought out that we are constructing new roads at *less than half* the rate needed, if we ever hope to overcome highway deficiencies.

(3) In the Southeast, as in other sections, there are problems of matching federal highway funds. All states, however, must find more revenues for highway work; some states a lot more, and soon.

Corning Named by Cement Association

The Portland Cement Association announces the appointment of Leo H. Corning as manager of the Structural and Railways Bureau, 33 West Grand Avenue, Chicago, effective April 1, 1949, to succeed the late Arthur J. Boase.

Mr. Corning joined the staff of the Structural Bureau in May 1929, and has held the position of assistant manager of that bureau since March 1935. His close association with Mr. Boase and his wide professional experience in architecture and engineering have ably fitted him for his new responsibilities.

How

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TEXAS . . . bituminous . . . a P&H Stabilizer processed a state highway project at a rate of 8000 sq. yds. per day.



IOWA . . . soil-cement . . . a P&H Stabilizer completed a 10-mile, 24-foot road in only 20 days.



CALIFORNIA . . . bituminous . . . a P&H Stabilizer reprocessed a 10-year old "oil-mat" to a 3-inch depth at a rate of 1000 sq. yds. per hour.



NEBRASKA . . . clay-gravel . . . the sub-base of this airport was processed at 1900 sq. yds. per hour with a P&H Stabilizer.

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In all power shovel applications, capacity and utility are essentials. A truck shovel must have high speed mobility, be immediately convertible, and have adequate capacity to be economical on every job. A "QUICK-WAY" has all these fundamentals plus a long list of others.

"QUICK-WAYS" are designed for full truck speed, on or off the highway. Mounted on any standard truck, the working parts provide perfect operating balance for the truck shovel. All-steel construction gives built-in strength and lightness for maximum capacity and stability.

You get more utility out of a "QUICK-WAY" fully equipped, than any comparable equipment. Each "QUICK-WAY" is easily converted in minutes from Shovel to Crane, Dragline, Clamshell, Pile Drive, Scoop, Trench Hoe, Backfiller, etc. Buy only the attachments you want; your "QUICK-WAY" does more jobs better.

Parts are rugged and simple, requiring a minimum of servicing and having proved ability to take a life long beating. Many interchangeable parts and easy accessibility simplify maintenance and repair. From engine to attachment, every "QUICK-WAY" part will deliver its capacity rating and more.

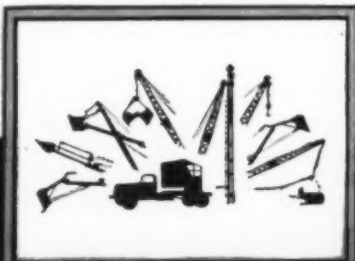
The essentials built into every "QUICK-WAY" mean sure profits on a small investment; economical to buy, economical to use, it's one of the most useful machines you can own. There's a "QUICK-WAY" owner near you; ask HIM.

MODEL E: 4/10 cu. yd. capacity,
mounts on any standard 5-ton truck.
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mounts on any standard 1 1/2-ton truck.

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More Equipment Utilization Data

Utilization of Available Working Time of Powers Shovels on 10 Active Highway Grading Jobs in Eastern and Southeastern States. Report No. 3, Committee on Economics of Highway Construction and Maintenance Methods, Highway Research Board.

OVER the past 18 months, equipment production studies being conducted by the Public Roads Administration reveal that delays to power shovels on active highway grading jobs amount to 63% of the total available working time. These studies were made on 16 power shovels, varying in size from 1 1/4 to 2 1/2 cu. yd. on 10 different projects in eastern and southeastern states.*

Table 1 shows the percentage distribution of 1,640 hours total available working time as obtained from the studies.

Table 1.—Time Distribution

Distribution of 1,640 hours total available working time for 16 power shovels on 10 active highway grading projects

Time element	Percentage of total available working time	
	Range	Average
Total available working time ¹	100	100
Major delays ²	4-80	42
Net available working time	20-96	58
Minor delays ³	5-42	21
Actual productive time	14-70	37

¹The sum of (1) normal daily shift time and (2) such occasional overtime as actually worked.

²Individual delays of 15 minutes or more in duration. See Table 2 for detailed classification.

³Individual delays of less than 15 minutes in duration. See Table 3 for detailed classification.

⁴Minor delays amount to 36% (21/58) of the net available working time.

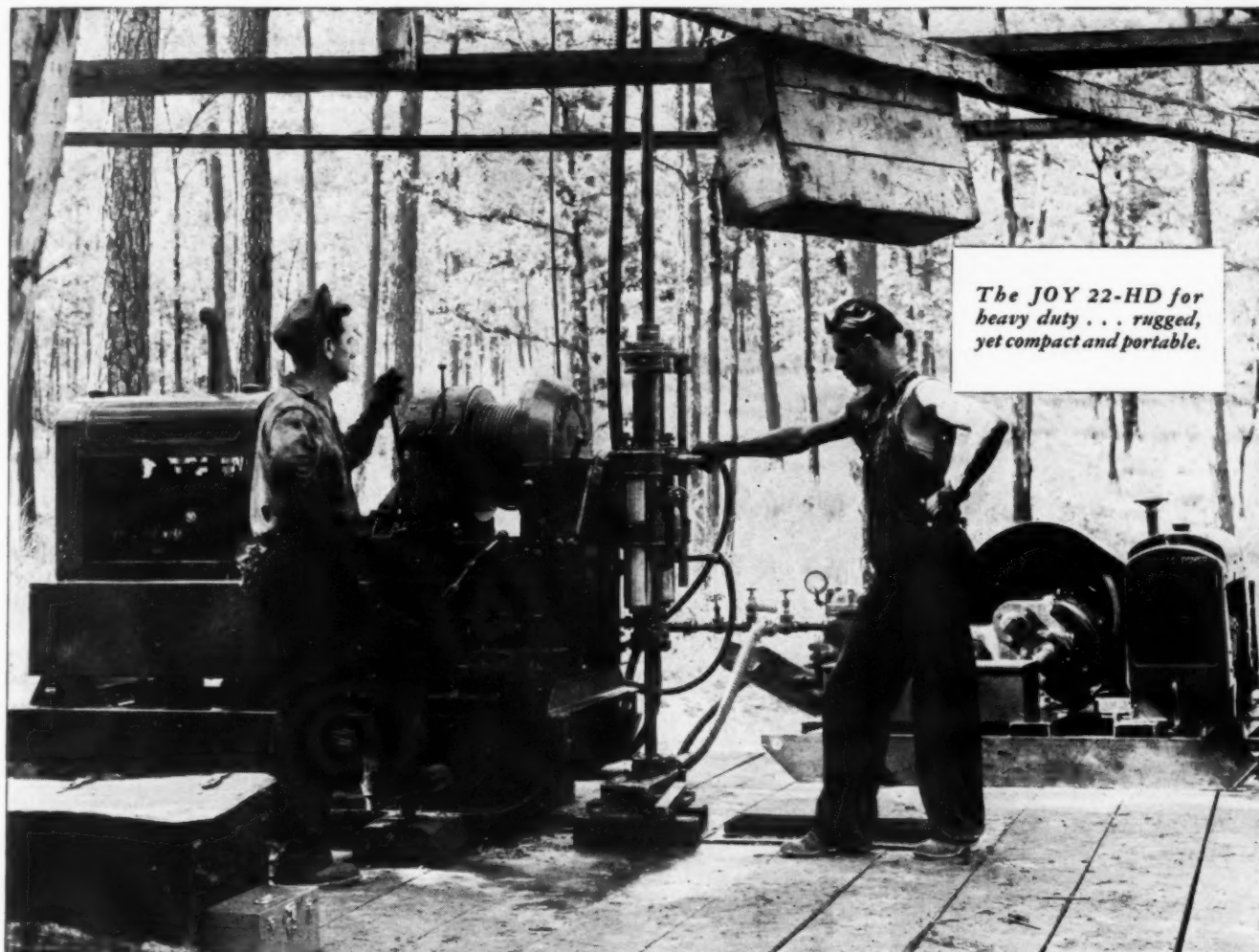
There is considerable variation in utilization of time among jobs as indicated by the ranges of the percentages in Table 1. One of the principal items causing these variations is weather. The extent of major delays due to weather and other delays of 15 minutes or more in duration is shown in Table 2.

Table 2.—Major Delays to Power Shovels

Nature of major delay	% total available working time
Rain and wet grade	28
Shovel repairs and maintenance	10
Opening up cut, improving working site	1
Blasting, rocks, roots	1
Move to new working site	1
Other	1
Total	42

*See May 1949 Roads and Streets for previous Reports No. 1 and 2 on equipment generally and on concrete paver utilization.

(Continued on page 62)



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(Continued from page 60)

With one exception, all shovels experienced major delays due to shovel repairs and maintenance. However, not all of this time was lost in actual repair operations; some was lost in waiting for the needed parts to be delivered to the job after they had been ordered.

The classification of minor delays is shown in Table 3. Although minor delays are ordinarily just a few seconds each in duration, it will be noted in Table 1 that they amount to 21% of the total available working time. However, the full extent of minor delays can usually be better visualized by comparing them to the net available working time. For example, when minor delays are expressed as a percentage of the total available working time, a job with frequent and extensive major delays, such as bad weather, might show a proportionately less percentage of minor delays than a job with a few major delays. Thus, a better basis for indicating the extent of minor delays in relation to the production operation is to express them as a percentage of the net available working time.

For the 16 power shovels which were studied, the minor delays varied from 23 to 54% of the net available working time with an average of 36%.

Table 3.—Minor Delays to Power Shovels

Nature of minor delay	% net available working time
Insufficient number of hauling units at shovel	12
Trimming and cleaning up work site	7
Short moves to maintain digging position	4
Shovel repairs and maintenance	4
Waiting while hauling unit maneuvers into position to obtain load	3
Maintain loading area and haul road	2
Handling rocks, roots, and stumps	2
Operator and personnel delays	1
Other	1
Total	36

An endeavor was made to classify minor delays in accordance with their basic cause, but in those instances where the basic cause could not be determined, the delays were classified in accordance with the apparent cause. For example, the basic cause of a delay of a few seconds or perhaps a minute to the shovel from a lack of hauling units may have been due to a breakdown of spreading equipment on the fill; but if this fact could not be readily determined by the observer, the delay may have been charged to a lack of hauling units at the shovel.

Future reports will deal with the hauling units, operating cycle characteristics of power shovels, and other phases of power shovel grading operations.

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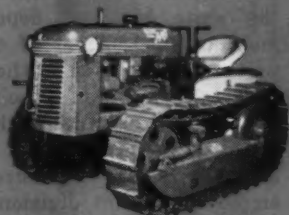
OLIVER "77" Industrial



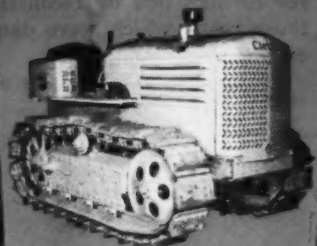
OLIVER "88" Industrial



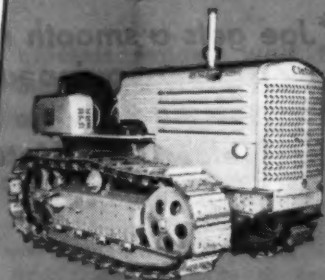
OLIVER "900" Industrial



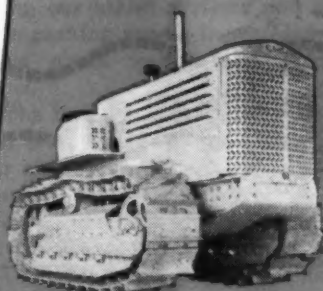
OLIVER-Cletrac Model HG



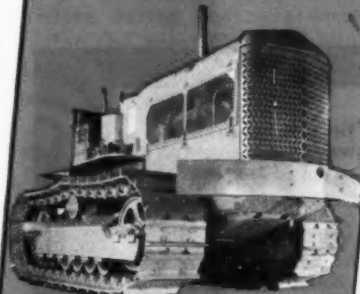
OLIVER-Cletrac Model A



OLIVER-Cletrac Model B



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Secondary Roads Engineer for Each PRA Division

Commissioner MacDonald of the Public Roads Administration is planning to appoint special staff assistants to the Division Engineer who will have full responsibility for the secondary road program in their respective divisions. The title of these appointees will be Engineer of Secondary Roads. Their whole time will be devoted to administering the secondary road program. Their first major assignment will be to cooperate with

the Board of County Consultants and the state highway departments in making an inventory of county highway administration in their divisions.

The first position to be filled is that in Division 3 of PRA in the southeast. According to an ARBA report, the man selected is L. W. Turoff, formerly employed in that division. It was he who had charge of working out the agreements with Tennessee counties for construction or reconstruction of those roads which were damaged because of war maneuvers.

We believe this will be a forward

moving step in the administering of the Federal-aid secondary program. It is hoped that these newly selected officials will be able to contribute much to the improvement of county highway administration in their respective districts. It is recognized that the improvement of county highway administration will remove many of the headaches which occur now in working out the Federal-aid secondary program. Commissioner MacDonald and the PRA are to be complimented in the creation of this new office.

12 States Enact Motor Fuel Tax Increases

Increases in motor fuel tax rates have been enacted by legislatures in 12 states during 1949 (up to May 5) according to a survey by the National Highway Users Conference. Proposals to increase motor fuel taxes have been introduced in more than 30 states this year and thus far have been defeated in 7 states. Proposed increases are still pending in 12 state legislatures.

The North Carolina increase was contingent upon the voters' approval at the June 4 election of a \$200 million secondary road bond issue. Petitions are being circulated in New Mexico and North Dakota to refer the increases enacted in those states to the voters. In North Dakota sufficient signatures have been filed to suspend the increase until a referendum vote. States in which increases have been enacted by 1949 state legislatures are:

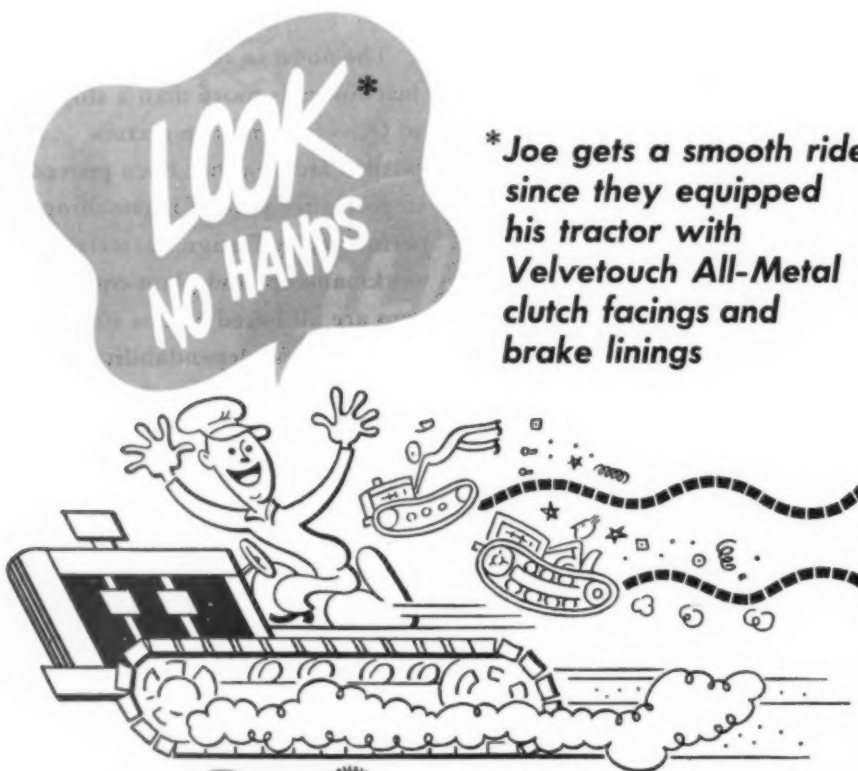
	Increase (per gal.)	New Rate (per gal.)	Effective
Kansas	1c	5c	July 1, 1949
Minnesota	1c	5c	April 26, 1949
Montana	1c	6c	July 1, 1949
Nevada	½c	5½c	July 1, 1949
New Mexico	2c	7c	June 10, 1949
North Carolina	1c	7c	Jan. 1, 1950
North Dakota	2c	6c	July 1, 1949
Oklahoma*	1c	6½c	
Oregon	1c	6c	July 1, 1949
Pennsylvania	1c	5c	June 1, 1949
Vermont*	½c	5c	July 1, 1949
Washington	1½c	6½c	March 21, 1949

The Idaho and Maine legislatures made permanent 1c temporary taxes which were due to expire. Proposed increases were defeated in Arkansas (2c), Indiana (2c), New York (1c), South Dakota (1c) & (2c), Utah (2c), West Virginia (1c), and Wyoming (1c).

Bills increasing the motor fuel tax are pending before the legislatures in California (½c), Connecticut (1c), Delaware (1c), Florida (1c), Illinois (2c), Massachusetts (1c), Michigan (2c), Missouri (2c), Nebraska (1c), New Hampshire (1c), South Carolina (1c), Wisconsin (1c).

Decreases in motor fuel tax rates also are pending in California and Delaware and failed of enactment in Maine and New Mexico.

*Increases in Oklahoma and Vermont have passed the legislatures and are expected to receive executive approval.



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Some Solutions to Every Day

Traffic and Parking Problems

By Grant Mickle

Traffic Engineer,
Automotive Safety Foundation,
Washington, D. C.

THE unprecedented demands of modern transportation, with its motor vehicles and mass transit conveyances, have rendered the traditional checkerboard street system wasteful, dangerous and obsolete, presenting problems of safety and traffic congestion that threaten to seriously impede business and social progress in our cities. Adding its headache to the general picture is the parking dilemma, which is becoming increasingly important as a transportation problem.

The great American traffic problem is a challenge to engineers, planners, governmental authorities and other concerned official bodies and to the public.

To stimulate action, and particularly to arouse the interest of businessmen, the Chamber of Commerce of the U. S. recently published a booklet "Making Better Use of Today's Streets" which shows by case studies how cities may get results quickly and at relatively low expense. The booklet concludes with a check list which makes it easy for readers to determine whether their cities measure up. As a matter of interest, a newspaper in one city recently ran a series of feature stories, comparing conditions against the 33 questions in the check list. That city scored 34%, a result which materially strengthened the city's decision to employ a traffic engineer. Much of the material for this article is based on the contents of the Chamber booklet, which was published with the cooperation of the Automotive Safety Foundation.

Checkerboard streets all nearly identical, encourage traffic to spread

City officials needn't wait for multi-million-dollar expressways. Here are suggestions for making better use of present streets at reasonable cost

over every city street, bringing hazards and traffic conflicts to every neighborhood. But, to completely revamp our street systems and to provide parking spaces in crowded downtown areas would cost prohibitive sums.

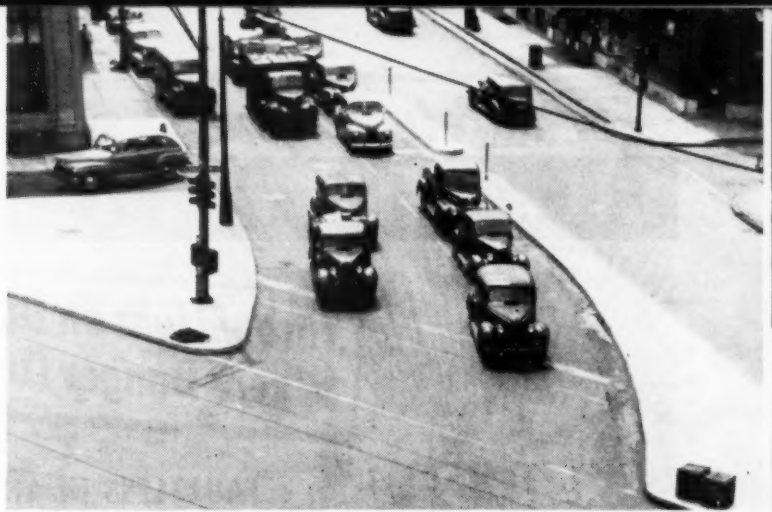
The tragedy is that the same problem we now find in older sections of our cities is being created so often in new suburban developments where proper planning at the outset could have prevented it.

Unless there is proper planning and regulatory supervision, shopping centers which will be built in new subdivisions during the next decade will suffer the same types of blight and traffic congestion our cities are now experiencing.

Proper planning for safe and efficient highway transportation includes the construction of adequate modern urban expressways into, through and around business areas, using to the maximum our existing streets, and providing adequate terminal or parking facilities.

Whatever the long-range solution to the congestion problem in urban centers, the situation in many communities, both large and small, is much too serious to mark time while waiting for such eventual relief to materialize.

Expressways and other major improvements are necessary, but we must face the fact that most of our existing streets will have to continue to serve us for a long time to come. Therefore the sensible thing to do is



★ Channelizing of irregular or complicated intersections speeds traffic flow, cuts accidents

not only to make plans for new facilities but also to find ways immediately to make the present street systems more efficient and safe. Fortunately there are any number of small and relatively inexpensive things which the average city can do. Many weaknesses in facilities and operations can be quickly determined and remedied through recognized procedures of traffic engineering.

1. Curb Parking Control

Chicago offers a classic example of the extraordinary effectiveness of simple traffic-control measures. Back in 1925 the congestion became well-nigh intolerable on State street, in the Loop district. After a technical analysis of the situation, a 3-fold plan was adopted. Curb parking was banned. Left turns were prohibited. Traffic signals were coordinated to keep traffic moving. Not only did these steps provide immediate relief, but even today you can drive comfortably on State street at any time, despite the increase of traffic through the years.

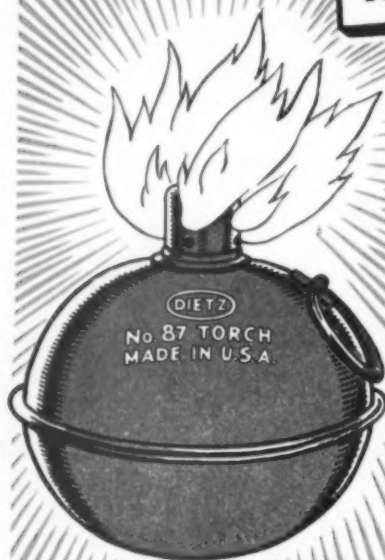
Many other cities besides Chicago—Detroit, Dallas, St. Louis, Providence, Boston and Philadelphia among them—have successfully instituted "all-rolling" regulations—that is, no stopping, standing or parking at curbs of streets within and leading to the central business district during peak-traffic hours. At first merchants are inclined to offer objections to the "all-rolling rule," but when they make studies of volume of purchases made at their store by 15-minute periods throughout the business day, they invariably become strong supporters of the curb-parking taboo during the rush hours. They find that it definitely helps their business.

San Diego, Calif., has found that

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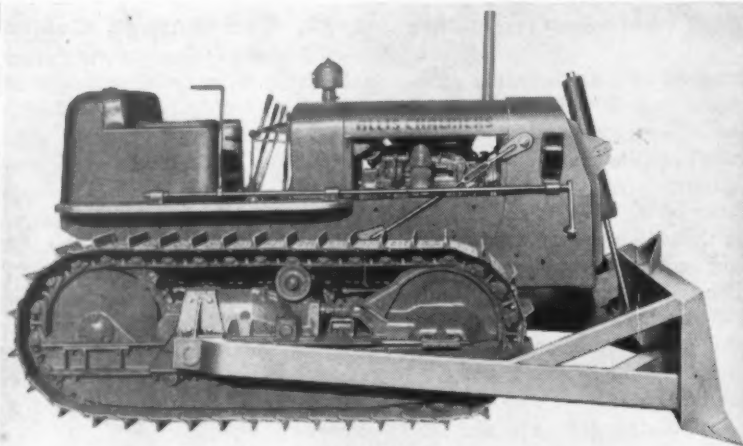
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her overtaxed streets could be relieved only by applying the no-parking restrictions on a total of seven miles of downtown curbs. Milwaukee permits no parking at any time on Wisconsin Avenue, a street on which bus stops are made in the middle of the block. Among the nation's most drastic restrictions on parking are those in Philadelphia. There, parking is excluded from practically all downtown streets, and where one and two-hour parking was permitted the time has been reduced to 30 minutes.

2. One-Way Streets

Another practical method of relieving congestion is by designation of one-way streets. One-way movement reduces the complications at intersections, cuts down accidents, facilitates the timing of traffic signals, speeds up the traffic flow, and increases the capacity of the streets. For instance, by simply making this change, capacity of two of the main arteries in Syracuse was increased 40% and 20%, respectively. And whereas speed on the two streets used to average about 10 miles per hour, it now averages 23.

In applying test of accident rates, one-way streets come through with flying colors. They reduce troublesome vehicle movements at intersections and eliminate head-on collisions. With good enforcement and proper driver obedience to the one-way regulation, one-way streets add materially to both pedestrian and driver safety. Records kept in Fitchburg, Mass., on 15 streets show that in the 2 years before those streets were made one-way a total of 38 accidents occurred. In the next 3 years, after the change, only 5 accidents were recorded.

Washington, D. C., uses the one-way method part time on several streets leading to and from the downtown district, but on two of them traffic flows are reversed morning and evening. From 7 to 9:30 a.m. Thirteenth Street and Rock Creek Parkway are inbound, and from 4 until 6:30 p.m. they are outbound. Traffic is two-way at all other times.

The variable traffic flow arrangement is considered the logical way of increasing the capacity of those two arteries. However, when flows are reversed, or when a street is one-way for only part of the time, extraordinary precautions should be taken to keep motorists and pedestrians informed of the traffic flow changes. Washington has found it highly desirable to use plainly evident warnings including large flashing arrows.

When the reversed flow proposal was first made a decade ago, there was considerable skepticism, but today the method is highly regarded.

3. Traffic Re-routing

Rerouting has greatly eased the congestion headache of innumerable communities. The advantage of this measure is that it re-directs the main flow of a city's traffic more in line with current conditions, instead of on a pattern that may have prevailed since pre-automobile days. Traffic capacity and speeds often can be increased by establishing a series of through streets for preferential movement. A by-pass route also can be developed to syphon off a considerable part of the traffic that now clogs the downtown area.

Bay City, Michigan, handicapped, at least traffic-wise, by the Saginaw River with one of its four bridges near the business district suffered unusual traffic congestion. With the aid of the state highway department a new routing pattern was worked out successfully. Two state highway routes entering the city over the same bridge were separated and routed over different streets. Again, each of these highway routes were split, with traffic in each direction routed over separate streets. By so doing, except near the bridge, only half of the traffic on each of the two state highways was thrust upon any one street. Travel was further facilitated by making two sections of a street one-way, and by eliminating curb parking on one side of two streets for a total distance of eight blocks.

The solution was not an armchair job. Factual information was obtained by a traffic survey which gave the volumes, directions and movements of traffic carried on major streets for various periods of typical business days. From the resultant traffic flow maps it was a relatively easy matter to devise a smooth working pattern of routes.

4. Turning Controls

When two busy streets intersect in the center of a business district, something has to give way. Rockford, Illinois, found that the solution was elimination of both right and left turns.

The intersection is used heavily throughout the day by both vehicles and pedestrians. For some two years left hand turns were banned but while that relieved some of the congestion, the right hand turns still interfered with pedestrians. In late 1940, right hand turns were eliminated also. The difficulty at the intersection promptly disappeared.

Before the elimination of turns, it was necessary to have two police offi-

cers at the intersection to control traffic. Now one officer is sufficient, and he devotes nearly all his time to the control of pedestrians. Incidentally, all pedestrians are required to cross on the green light only.

5. Through Streets

The possibilities in judicious use of the through street are shown in Detroit. Several years ago it was determined to establish a system of preferential streets, in addition to major arteries, on those routes where traffic volumes were heavy and accident rates high. Because funds for sign installation were limited a priority system was set up for step by step progress. In a few years an integrated network of more than 100 miles of through streets was obtained.

Even though many of the through streets were established during the war period, traffic increases of 5% to 20% were noted, and speeds were increased. Traffic accidents are in a sense a measure of a street's efficiency. On that score the through streets came through with a good record—accidents went down 50%.

6. Better Traffic Signals

Generally speaking, uniform signals, synchronized for progressive operation, can do much to create order out of chaos at busy intersections, which as we all know, generate most of the congestion in the business district.

South Bend, Ind., plagued with a number of high-accident street intersections decided to replace two-lens traffic signals with the three-lens type. The two-lens signals (not recommended in the Manual on Uniform Traffic Control Devices) were located on poles 6 inches below the minimum standard height, with one signal facing in each direction. Five initial 3-lens installations were made at intersections outside the business district, with the signals placed on standard signal posts. One year before the installation, traffic accidents totalled 106. The first year after, accidents dropped to 65, a 40% reduction. Not only were accidents curtailed but traffic moved much more smoothly.

In 1946 South Bend replaced two-lens signals with three-lens signals at 22 locations in the central business district. The city traffic engineer re-

Can You Answer These With "Yes"?

Does traffic on your main streets flow smoothly and without interruption through a system of coordinated traffic signals?

Are one-way streets provided to help increase the capacity of your existing congested streets?

Are adequate parking time limitations enforced to give equitable turnover of curb parking space?

Are traffic operational problems the responsibility of one qualified city official?

Is there an active, aggressive civic committee whose chief interest is safe and efficient street traffic operation?

ports that although before-and-after traffic accident studies have not yet been completed, indications are that a substantial decrease will be shown despite a traffic increase of 34% in the city area.

Even old equipment can be put to good use. In Kansas City, Mo., Gillham Road at one time was equipped with independent, non-coordinated traffic signals at five intersections in a distance of 1¼ miles. Traffic piled up at each intersection during rush hours. Although not interconnected, the five signals were equipped with synchronous motors and then were coordinated to give progressive traffic movement. To keep the non-interconnected signals progressive they are given a daily check and are re-timed as necessary. After the change, traffic jams ceased. Soon the traffic volume had increased 17%, even though there was no city-wide increase at the time. And running time was cut by 22%.

7. Channelization

Another useful device in coping with the intersection problem—particularly complex and irregular intersections—is channelization. Traffic islands, solid or painted, are used to confine vehicles to definite lanes, thus avoiding or reducing disorders arising from conflicting movements. Cities are coming to regard these islands as indispensable for pedestrian refuge, for streetcar loading zones, as

(Continued on page 91)

★ "Before and after" constructing safety islands at South Bend, Ind. Trial islands were installed to determine proper placement before final construction



Power Maintenance Methods

Greater Mechanization

—HIGHWAY MAINTENANCE "MUST"

- Hand labor still big factor in total maintenance cost, despite two decades of mechanization progress
- New units being devised and tested; greater use of commercially available, proven equipment seen

Progress Report of Project Committee on Maintenance Costs, Highway Research Board

J. S. Bright, Chairman, Deputy Commissioner, Public Roads Administration; W. H. Behrens, County Engineer, Linn County, Iowa; T. H. Dennis, State Maintenance Engineer, California; A. Diefendorf, Head of Civil Engineering Department, University of Utah; J. J. Forrer, State Maintenance Engineer, Virginia; W. K. Myers, Chief Maintenance Engineer, Pennsylvania.

THIS committee presented, at last year's meeting of the Highway Research Board, a report on the rise in maintenance costs from 1935 to 1947. The interest in this report was so extensive that it was decided to issue the index on a semi-annual basis.

In June, 1948, we computed the index for the first half of 1948. A report was distributed throughout the states in the hope that it would be of value to the highway departments in substantiating their budgets for 1949.

The maintenance cost index for the first half of 1948 showed an increase of 8% over 1947, 72% over 1940, and 86% over 1935. Labor has, of course,

shown the most substantial rise, 7% over 1947, and 113% over 1935. Material costs have increased 11% over 1947. This is principally due to the large rise in the cost of bituminous material, approximately 2 cents per gallon. Equipment costs have also increased materially, 12% over 1947. As usual, the overhead costs have risen least of all, 5% since 1947. Even this increase is due principally to the rise in the lower salaries and wages; the engineering salaries have gone up even less.

The average cost of maintenance for the entire year 1948 was 88% above the 1935 cost. In other words, the 1948 dollar produced, in terms of the 1935 dollar, only 53 cents worth of maintenance.

Mechanization Imperative

This rapid increase in costs indicates that we, as maintenance administrators, must devise new and improved maintenance equipment and new and improved maintenance methods and procedures in order to increase the productivity of our maintenance efforts and thereby increase the value of the maintenance dollar.



The 17-page symposium beginning on this page is No. 2 in a series of monthly presentations on timely construction and maintenance topics by the Roads and Streets editorial staff and contributors. Next month: Trucking and Hauling



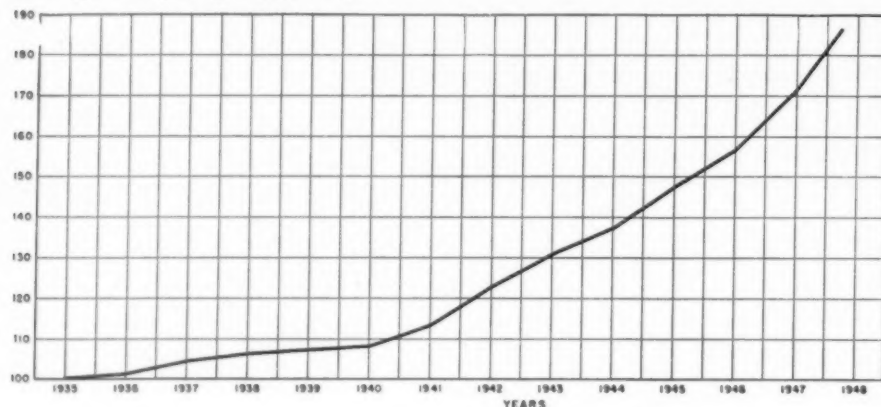
★ Mowing and weed control are well mechanized today except for hand work around structures and in other poorly accessible places. Maintenance departments are in need of better power units for operating flexible hand-held trimmers, brush cutters, etc.

Year	Labor	Material	Equipment	Overhead	Total	Year	Labor	Material	Equipment	Overhead	Total
1935	100.00	100.00	100.00	100.00	100.00	1943	151.82	117.76	114.46	116.87	130.88
1936	102.19	104.31	97.97	100.29	101.24	1944	162.42	123.22	116.77	119.81	137.34
1937	108.48	104.42	99.31	102.50	104.46	1945	171.16	130.10	139.89	135.01	147.52
1938	110.17	103.73	103.51	103.97	106.36	1946	180.56	132.62	141.28	148.30	156.40
1939	111.29	101.64	105.87	105.83	107.23	1947	198.40	145.83	153.39	162.98	171.28
1940	112.33	100.30	107.12	110.20	108.13						
1941	121.16	102.86	110.11	111.33	113.30	First 1½					
1942	134.93	115.68	113.27	113.93	122.83	1948	212.74	161.20	171.60	170.42	186.44

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★ A Huber grader and an Allis-Chalmers tractor with blade on Texas county road work. Light mobile units of these types are gaining in popularity



★ Chart 2. Cost trends—composite of labor, material, equipment rental and administrative overhead costs for state road maintenance and operation

hand loading.

Chemicals. Several of the states are experimenting with or have adopted the use of some type of herbicide. These selective chemicals kill off the most troublesome vegetation and allow the better grasses to grow. In this way the necessity for removing the cuttings is reduced or eliminated.

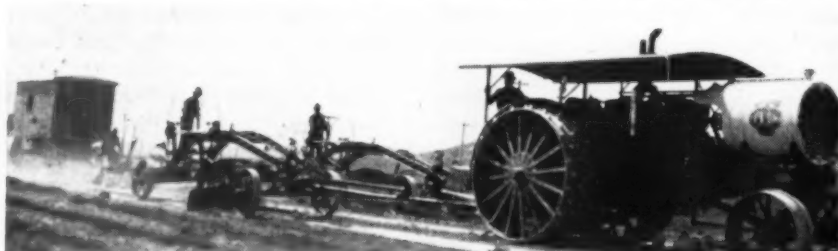
Ditches. The cleaning of the road-

side ditches also entails much hand labor. Many types of tow and power graders have been developed which will do an excellent job of cleaning and reshaping the ditches. Here again, the difficulty is that we must dispose of the excess material. This is a handling operation, loading and hauling. Recently, power loaders have become available that will load this ma-

terial at a fraction of the cost of hand labor. It is reported that the actual loading cost can be reduced to three cents per cubic yard. It is necessary in most cases, however, to blade this spoil onto the shoulder or surface of the highway in order to make it available to the loader. This is not advisable on many of our surface types since the spoil usually contains an excess of fines. These should not be allowed to lower the quality of the stable shoulder or surface material. A machine which would shape the ditch and at the same time carry the spoil over the shoulder into a truck appears to be a desirable development.

Over half the cost of the remaining maintenance operations which together account for over one-quarter of our maintenance expenditure can be attributed to labor. The introduction of new equipment types together with the consequent improvement in our maintenance methods and procedures should materially increase the productivity and decrease the cost of these operations.

The Good Old Days in Wyoming Road Maintenance



★ We are indebted to W. E. Sutton, maintenance and equipment engineer, Wyoming state highway department, for these interesting snapshots reminding us of how far we've come in mechanization. Taken some three decades ago, they show one of the early Holt tractors and a steam tractor with pull graders. Pull graders of more modern design are still useful in road work. The horse and mule also are still seen on road work





★ Shoulder reshaping and sod removal is one of the maintenance jobs that modern loaders have greatly speeded up. This scene is in Ohio. Outfit includes an Athey loader, motor grader, dump trucks

Power Equipment

Trends in Highway Maintenance

By H. A. Radzikowski,

Chief Division of Maintenance,
U. S. Public Roads Administration,
Washington, D. C.

Every highway and street department leader should read this thought-provoking survey. Contractors, too, since they will participate increasingly in highway upkeep.—Editor

IT would be amiss to pass on to my principal subject without taking notice of the cooperative spirit of the highway industry that the presence of this group represents. It represents teamwork for the common objective of better roads for better transportation. The highway official, engineer, contractor, material producers and equipment manufacturers joined here in conferences to discuss and develop mutual understandings on how to work together in the harmonious solution of common problems. The smoothness with which the highway industry operates is accepted as a matter of course. However, engineers from friendly foreign countries who come to our offices to learn of the nation's success in highway accomplishment are impressed with the conference methods of developing teamwork in industries' part of the highway program.

The first days of the meetings here

in Savannah were devoted to a review of equipment improvements that would be helpful in performing better quality and less expensive highway work, and in determining the direction in which further mechanization is needed. The remaining days of the conference were devoted to an evaluation of the size and nature of the highway program that lies ahead. It should be helpful to the contractors in gearing their organizations to needed performance capacity, to the material men in setting production sites, and to equipment manufacturers in meeting the basic mechanical goals of the highway industry. Thus the entire conference will be a means of establishing the subject of my discussion "Trends in Power Equipment Maintenance Methods."

Mechanization Trend

The upward trend in mechanization of road maintenance operations is clear from the fact that in 1936 when 145,795 men were employed in the maintenance of 392,418 miles of rural highways under state control, they used 74,481 major equipment units as mechanical aids in the performance of their duties. In later years manpower became scarce, the mileage of highways expanded, and highway users' demands for service became more ex-

acting. In the face of the expanded volume of work in 1948 only 79% of the number of men employed twelve years earlier maintained about 550,000 miles of rural highways under state control with 130,010 major equipment units. While many of our roads took a beating from increased use, action of the elements and obsolescence, nevertheless, our maintenance forces with their mechanical aids are to be commended for bringing our roads through without more casualties.

Annual Equipment Use

State Highway Department Maintenance and Operations

Classification	Number of Units
Automobiles (incl. station wagons and pickups)	12,644
Blades, Bull Dozer, Straight and Angle	427
Compressors, Air	1,422
Distributors, Bituminous	1,472
Graders, Motor	6,041
Graders, Tow (incl. maintainers)	8,081
Heaters, Kettle Type	6,732
Loaders	2,238
Mixers	2,174
Mowers	6,965
Plants, Crushing	499
Plows, Snow (displacement type)	17,346
Pumps	1,394
Rollers, Power and Pull	3,456
Scrapers	841
Shovels, Power (cranes, etc.)	1,105
Spreaders	6,875
Sweepers	940
Tractors, Crawler and Wheel	8,692
Trailers	1,923
Trucks (all types)	29,573
Welding Machines	222
Unclassified Major Equipment	8,948
Total	130,010

There was an estimated 329,698 major equipment units used in 1948 by all state, county and local and city and village highway organizations in the maintenance of all highways. It has an approximate cost new valuation of \$1,136,837,000. A summary of the state highway department inventory of 130,010 pieces of equipment is given here as an indication of the trend of equipment usage.

While part of this equipment is old or obsolete, the custom has developed in some areas of stretching it along another year to see what happens in equipment development. In such instances, there is a deep-rooted uncertainty as to how to build a modern fleet of power units for today's maintenance programs. Some large-scale equipment operators have the healthy concern that they may be buying themselves fleets for which they must later find work, whereas the sound procedure is to buy equipment for a clear cut need. Yet many machines after acquisition develop new unforeseen uses.

Total highway construction expenditure in 1948 on all state, county, and local highways was \$1,569,000,000; on road maintenance it was 1,132 million dollars. Base and surface on construction approximated 39.8% of the expenditures. On maintenance it was 48%. Highway maintenance departments are reporting that it is becoming increasingly difficult for maintenance crews to get off the surface and to get onto other work because of volume of surface repairs needed. With the large volume of old and narrow pavements which will have to await their turn under maintenance

before they can be reached for reconstruction because of limited revenue, the maintenance work is further on the increase. For these reasons, the major effort in mechanization development should continue on surface operations.

Hazardous Shoulders

The condition of low and hazardous shoulders adjacent to narrow 18-ft. pavements in the face of increased volume and speed of passenger vehicles and trucks is a pressing problem. At least one company has on the market a shoulder trenching machine which is worth observing. It both excavates and loads the material on trucks, or deposits it on the side, depending on the requirements of the job. The shoulder-trenching process is needed in surface widening. Even where the surface is amply wide there is a tendency to trench and remove unsuitable soils on the shoulders and replace them with granular material where it will help drainage from under the surface. It is to be noted that our railroad friends have similar ideas in the ballast excavator which they have been using in removing fouled aggregates from multiple-track main lines. They have removed and loaded the aggregates with the same equipment combinations into 65-ton gondola cars for disposal or cleaning. The fastest loading time is 12 minutes per car. It is reported as being most helpful where traffic is heavy and interference must be at a minimum. It also sounds like a highway need.

Better Surfacing Equipment

Many large-capacity material mix-

ing and surface finishing machines have been developed for high and intermediate type surfaces. This is a field in which economy can be effected by a careful keeping of unit costs and service behavior records of both the machine and the pavement in place. As an example, a highway department which kept close records found from an analysis of each of its ten plants which varied in type and age that six plants of the old type produced 61,800 tons of paving plant patching material at \$10.19 a ton. The modern plants which have greater capacity showed a production cost up to \$1.50 a ton less. In the four newer plants the average cost was \$8.75 a ton. Production of 81800 tons at a possible saving of \$1.44 per ton is approximately \$89,000. The state through such cost analysis is well acquainted with the problem and is gradually acquiring more modern plants.

There is also room for improvement in small bituminous patch mixers. Most available patching mixers do not fully fill the requirement for a typical maintenance patching job. It would seem that a plant to do this type of work should have the following features:

1. A capacity limited to something in the order of 40 to 60 cu. yd. per day to discourage maintenance forces embarking on large scale resurfacing that might be more adaptable to contract method of operation.
2. The plant should be portable so that it can be set up and start working in a new location in not over one hour.
3. Accurate proportioning devices should be a feature of such a mixer.
4. It should have a transfer pump for bituminous material and a self-contained heating device to maintain the temperature of the bituminous material.

New Type Burner

The hottest thing around the City of Washington lately is an ingenious burner developed by a District of Columbia highway contractor for bituminous patching. An asphalt spreader had been converted into a complete mobile self-contained heater unit to remove the old asphalt surface preparatory to replacement with new asphalt. This machine crawls along the job burning an area of asphalt approximately 144 sq. ft. One job was in a highly congested section of the city and was carried on with no interruption to automobile or streetcar traffic.

The main features of the transformed machine consist of a canopy of steel floor plates covering seven burners which confine the heat to the area to be removed. This heating unit is raised and lowered by the same machinery which was originally used to operate the hopper of the spreader. The operator is protected from the in-



★ The dump truck is the No. 1 unit in highway maintenance, with an estimated 70,000 in use. Skillful utilization of trucks, as well as selection of right type and size, is a big and challenging responsibility of the maintenance department



★ Shoulder maintenance continues to be badly neglected on thousands of miles of arterial highways, resulting in hazardous conditions. Shown here are two of many types of units for keeping shoulders in shape

tense heat of the burner unit by means of sheet metal plates but spends as much time only as necessary at the controls to advance the machine as the progress of the work requires.

There is at least one improved type of a machine on the market designed to pulverize old black top surfaces preparatory to their rehabilitation. The performance record should be interesting to observe. It eliminates much of the discing and harrowing which may interfere with traffic. It leaves the torn-up surface without large chunks. No one-way traffic is necessary on the surface being rehabilitated except around the machine doing pulverizing. Less equipment is in the way of traffic. It is the modern trend to give the highway user who pays the bill better service even while the road is being rehabilitated.

Motor Graders Selection

There are over 23,000 motor graders in use by state, county and local highway departments. Inventories indicate that there is a 90% increase in the use of motor graders over 1936. The trends in sizes have not changed too much as between heavy and lightweight graders. Sixty percent were of the lighter weight in 1936; 57% in 1948.

There are uncertainties among the engineers as to the sizes of motor graders that should be used in building up an equipment fleet. The larger motor graders have been found particularly adaptable for road mixing bituminous materials and laying oil mats. They have enough power to make the necessary speed and do a fine job of mixing. They give satisfactory performance in blading work since the blade will stay in a set position. The machines are also adapted to grading sections, but one state maintenance engineer feels that they are very expensive and the rental rate is too high. Another state maintenance engineer states his views as follows: "As perhaps you know our state main-

tains the entire road mileage of the state with the exception of three counties. We have a great many miles of secondary roads of the road-mix type. The heavy machine, a one-man motor grader, has a very distinct place in the reconstruction of roads, cleaning ditches and work of that nature, but we do find that the lighter one-man grader is a very efficient machine. The low cost of the lighter machine enables us to have twice as many machines. We have found the light-type machine to be suitable on roads where the material is not too heavy, but where heavy work is required, the lighter machine will not produce a smooth road surface."

Grader Uses Vary

A western engineer feels "that the question of cost, and the suitability of the lighter machine, makes it imperative that they be used. Larger machines can be kept ready for special jobs to be moved around the state as occasion requires."

But a western engineer from another state differs in opinion. He had this to say: "The light machine is O. K. for gravel maintenance, but on bituminous surfacing work our experience was that larger machines are needed. Using the light machines took too much of the operator's time. We get so much more accomplished on our operator's wages that it pays us even though the machine is expensive. The salaries are about the same but more work is accomplished with the larger machine. Supervisors have been trying to do too much work with the light graders, and they were not economical to use."

The highway maintenance grader and maintainer are an outgrowth of the crude log drags used in maintaining our first roads and trails. No one type of equipment exists in as many sizes, shapes and forms as the grader or maintainer. It can be towed or power, small or large, multi-blade

or single-blade, wheeled or drag. The power grader or maintainer, large and small, is a development of the past 20 years and has, through its mobility and operational speed, greatly reduced the unit cost of many blading operations. There are other operations, however, on which the tow grader is still the most effective tool. Many engineers feel that they cannot dispense with the tow grader on some ditch cleaning operations. There is a definite need for a reduction in the many models and sizes of blading equipment and for standardization of sizes between manufacturers. Such a reduction and standardization would reduce the manufacturing, acquisition and maintenance costs and would facilitate the selection of equipment for highway maintenance work.

Stabilizing Equipment

There are available several types of low-cost surface stabilizing machines. The field of operation is large, and there is room for further development. Out of approximately 2,383,744 miles of county and local rural roads in the Nation, 1,322,574 miles are non-surfaced and 1,061,170 miles are surfaced. Of the surfaced mileage 18% are low-cost bituminous or better, and the remaining 82% are gravel, stone or soil surfaced. The loss of surface material under traffic and action of the weather is costly to replace and a constant drain on the maintenance budgets. The further development of machines which will help to solve the low-cost road problem without having small local highway departments or contractors tying up too much in equipment investment would be very helpful.

Much has, of course, already been accomplished in the development of front-end loaders which has reduced the cost of loading spoil from ditches. [See article in this issue.] Needless to say there is a very definite upward trend in the use of this type of equip-

ment by state maintenance organizations.

Truck No. 1 Unit

The most frequently used piece of equipment in highway work and in road maintenance is the truck. State, county and local highway departments used approximately 68,800 trucks in 1948 in the maintenance of all rural roads. Using the 1936 inventory of trucks 1½ ton or over as a basis. 41.5% more trucks were used in 1940. 51.5% more in 1946, and 65.5% more in 1948.

Of these trucks, dump bodies comprised the largest category, constituting 96.2% in 1936, 98.2% in 1940, 95.6% in 1946, and 94.6% in 1948. The 1½-ton dump trucks still are the most popular although there was a slight falling off in favor of the 2-3 ton and 4-5 ton dump body sizes.

Better Truck Use

In traveling around the nation, one is very much impressed by the efficient functional design of trucks used by telephone companies in their maintenance and construction work. Highway equipment cannot be compared on the same level of efficiency to that employed by these companies. Take for instance the standard truck used in most highway organizations for patrol maintenance work. It is usually a conventional type dump truck which is designed to be loaded from a gravity tippable or by power equipment. It is very well known that the average patrol or maintenance gang uses its truck to haul bulk materials only about one-fourth of the time or less. The balance of the time it is employed in general utility work hauling men, tools, timbers, guardrail supplies, dirt excavated by hand from a ditch—to think of a few.

It would seem that the type of truck needed by a patrol maintenance gang would have the following features: (1) Low bed height for efficient hand-loading; (2) Power dumping; (3) Possibly a double bottom to allow

heating of patching material; (4) If used for snow plowing, the lights should be mounted high enough to clear the plows. Frames and bumpers should be so designed that snow plows can readily be attached and detached; (5) Provision for safety of workmen being carried to and from job such as removable sides and rear cab windows that will open.

Mower Equipment Criticized

The cost of cutting weeds, mowing, etc., is a substantial item. It cost eleven state highway departments 8 million dollars in one year or 8% of the maintenance budget. There were an estimated 10,590 mowing machines used on state, county and local rural roads in 1948. Mowers could be improved to better suit highway maintenance needs. While new highway designs have gentle slopes and roadside areas which will facilitate the use of farm mowers, it is necessary to live for a long while with highways that have more rugged areas to be mowed. More thought should also be given to the comfort and safety of the operator on rugged terrain.

Standard open shoulders and regular reasonably flat back slopes are mowed without trouble, and the pick-up of spoils is not too bad. But the mowing, brushing and subsequent clearing of steep embankment slopes, generally behind guardrail, and of steep, irregular, frequently obstructed back slopes, call for equipment better adapted to the purpose that we have yet seen. It is appreciated that a general straightening up and flattening of these slopes would be immediately helpful, and progress is being made in this direction as fast as practicable. But many miles will probably never be flattened so that present power-mowing equipment can reach them.

One state recently reported trying out heavy suction "picker-uppers" for removing cut grass and weeds from the shoulders. This machine was quite effective over such areas as can be reached but required much more flex-

ibility to handle the difficult places.

Hand scything is still the way of cutting the rough slopes and the high places in some areas, as well as the embankments behind the guardrails, and it is wholly unsatisfactory.

There has been recently developed a brush cutter that can cut brush up to 2 in. in diameter with ease at regular cutting speeds. It is claimed that cuttings up to 3½ in. in diameter can be handled at reduced speeds. While appearance of the mowed area is somewhat less pleasing than that obtained by hand methods, a report covering California highway department activities indicates that this shortcoming is offset by a considerable saving in cost of the work ranging up to 75%.

In Florida and Virginia experiments have been carried on in disposing of brush cuttings by running them through a shredding machine and using the output as a roadside mulch.

Winter Equipment Notes

There is a definite need for improvement in sanding equipment for the treatment of ice-coated pavements. As all motorists experience one time or another when ice forms on the pavement, practically the entire highway system becomes galvanized with ice and dangerous to motorists at the same time. Speed is necessary to furnish traction for the highway users. In order to move fast the sanding trucks should have traction for their own wheels; therefore, a development where sand is spread in front of the sand truck instead of the rear would be most helpful.

Snow removal equipment has not changed too much over the years. It is hoped that there is not too much smugness concerning the need in this field of equipment regarding experimentation with new methods. Snow removal equipment was put to a very severe test at great odds in the 1947-48 snowstorm in New York City and in the January-February 1949 western snowstorms. Only the heaviest types of rotary plows were able to handle the packed-down snowdrifts which resulted from the 60 to 70 mile an hour winds and the alternate thawing and freezing weather which caused ice crusts. Bulldozers designed for other work were often effective where snow plows could not penetrate. This is a field in which a double cost exists, the cost of snow removal and the loss of much needed highway-users revenue if the roads are not adequately and promptly cleared of snow.

A high ranking highway official with extensive experience and foresight recently asked me the following question, "If the lumber people can be so enterprising as to develop 1800-lb. pressure hydraulic jets which remove



★ Motor graders have nearly doubled in number on the highways since 1936. Both heavy and light types are favored for various work

the bark off of trees before they are processed in the mills, and equipment is available for mounting on the front of trains for melting snow, why can't some enterprising equipment manufacturer develop a piece of equipment utilizing either steam jets or heaters that will melt the snow without damaging pavements and send it down the city drains in the form of water without pushing or hauling bulk snow?" Now there is food for thought. If experiments can be carried on in the gasification of coal in mines to reduce bulk hauling costs, advancements in the snow removal field are certainly possible.

Urges Radio Experimentation

The use of radiotelephone in highway operations as a communication medium is making advancement. It proved useful in the western snow-bound area in dispatching the right type of equipment, to the right place at the right time. It was thus instrumental in obtaining better utilization of equipment involving costly investments. One state maintenance engineer reported that he had found 20% more snow removal work could be accomplished with the same equipment through the more efficient use possible by radio control of operations. It was also helpful in informing the public of road conditions so that they would minimize the use of the highway in the path of snow plows.

Other New Ideas

There are many other equipment developments or improvements that are needed but would take too much time to discuss here. There have been times when highway departments could not wait for the cooperative efforts of equipment producers, and developed their own equipment. Centerline marking machines are an example. The State of Washington has even added a loud speaker to their unit to warn the traveling public not to cross the wet paint line. The development of front-end loaders, the California improvements on distributors for joint and crack filling, road magnets for picking up metals which might cause punctures, the Florida traveling bridge shops, sign crew trucks and elevator ladders for traffic lights are just a few of many developments initiated in highway department shops.

There is also a definite need for giving more attention to the metals used in road maintenance equipment. For example, one highway department which orders about 500 tons of cutting blades at a time was advised that by the use of an alloy steel with vanadium, economy is effected by longer life of the blade though the first cost

is higher than for the plow steel type of blade. A very reputable contractor has also indicated that he is using drill bits of a special metal composition which while costing him about 10 times the ordinary drill bits gives him about 100 times the service.

Even when the equipment tasks are reasonably appraised and the equipment on hand is balanced, there is always the matter of repairs and storage. It is axiomatic that a lack of facilities for these purposes will prevent the equipment from being used to proper advantage, and shorten its useful life. Unless reasonable repair and storage facilities are provided, there can be no such thing as furnishing good machines and operators when, as and where their services are needed.

Improvements in highway garage layouts and types of tools used in some areas would also be helpful. The following are a few of the items that were noted in one garage inspected. (1) Heavy parts were stored on the second floor involving a back-breaking carrying job. (2) Window sills were high and restricted the full admission of sunlight onto the working floor. (3) The floor was lower than the surrounding terrain and would involve dampness and possible flooding. (4) The door had a 12-ft. width and could not clear some of the maintenance equipment with attachments. (5) The welding section was near the office and control desk, etc.

Another problem that needs solution is that of equipment ownership. Some highway departments are small units that cannot afford to buy specialized equipment that would be used for one or two operations and would be idle the remainder of the year. It is a subject worthy of further study.

In Conclusion

As stated earlier highway maintenance is now a billion dollar industry in which every effort should be made to reduce the heavy annual carrying charge through improved mechanization. Before closing I would like to quote a published statement made by Rex Whitton, Missouri State Maintenance Engineer, who is one of the most experienced and respected engineers in the highway maintenance field. His article in July 1948 had this to say about highway maintenance equipment:

"Missouri maintenance men think that highway maintenance equipment should be designed for highway maintenance, and should not be some glorified piece of farm or construction equipment that has received a little remodeling in order to make it slightly adaptable for highway maintenance work."

Certainly an industry of this size is worthy of attention in devising new equipment tailored for more effective use.

'Package' Program Passed in Minnesota

Prior to adjournment, the Minnesota legislature passed a "package" highway program consisting of: (1) a one-cent gasoline tax increase; (2) a constitutional amendment to change allocation of gasoline tax proceeds (the state highway fund, which now gets a 66%, would receive 50%, the counties 44% instead of 33%, and first-class cities 6%); (3) transfer of 721 miles of road from county system to state trunk highway system; (4) increases in passenger car, bus and truck fees; (5) authority for county boards to agree with municipalities and Highway Department to extension of state-aid county roads into and through municipalities.

Adds 720 miles to Trunk System— Bills signed by Governor Youngdahl of Minnesota will add 720 miles to the state trunk highway system and provide \$10,200,000 annually in increased funds through a 1-ct. increase in the state gasoline tax and higher motor vehicle fees.

Traffic on the Hutchinson, Saw Mill and Bronx River Parkways in the New York City area has increased 10% annually recently, according to a report. Last year, the first full year of operation of the new toll system, cars paying tolls on these parkways numbered 17,641,543.

Clearing House Section Outstanding Used Equipment Values

Over one hundred individual advertisers feature an exceptionally large selection of used equipment in the 13-page "Clearing House" section which starts in this issue on page 105. Readers will find the "Clearing House" a dependable and informative directory of outstanding values in used equipment and we suggest that you make perusal of these pages a regular habit each month. At any time that you have equipment you wish to sell, anywhere in the country, we suggest that you present your offerings in our "Clearing House." This section is growing faster, getting larger every month, because it's doing a better, quicker selling job—at one low cost!



SHOULDER CLEAN-UP. Surplus material picked up and loaded into truck without blocking traffic. (Ottawa loader with Allis-Chalmers WC industrial tractor)



SHOULDER FILLING. A common task, necessary where poor material is replaced, or where new pavement is just completed. (Lull loader mounted on Case tractor)

Front-End Loaders

Are You Fully Capitalizing their Possibilities in Road Maintenance Work?

AMONG the developments in power equipment for highway and street work in recent years, none has surpassed in versatility the front-end loader. While loaders are now used at many tasks, not every highway or street maintenance department has fully explored the uses of this relatively new tool. Even among contractors, who are quick to see opportunities to save money, some have been slow to dovetail loader work effectively into their various operations.

Other public agencies and private contractors, on the other hand, have taken to the use of loaders with enthusiasm. As noted in Mr. Radzikowski's article in this issue, over 2,200

units are now employed by state highway maintenance departments alone. Several thousand more are owned by such agencies as counties, townships, city street departments, park commissions, airports, federal agencies, and other public bodies in the public works field.

Loaders today comprise several specialized designs. The endless belt or bucket type loaders have an important place, but for discussion purposes this article will be confined to the uses of front-end type units.

What Size and Type?

Loaders of this type today are available in both pneumatic tired models and as units designed spe-

cially for crawler tractors. Sizes of wheel-type loaders range from less than 3,000 lb. gross weight including light industrial tractor mounting, to 15,000 lb. or more. Crawler-type units range from some 4,000 to 36,000 lb. or more. Each size and type has its range of performance, and selection of the right machine for individual tasks or for versatility in departmental work is a matter of some controversy today.

Loader efficiency has been improved year by year through mechanical refinements, and through the development of interchangeable equipment and special attachments. Refinements include hydraulic control of hoisting, and other motions, higher and farther



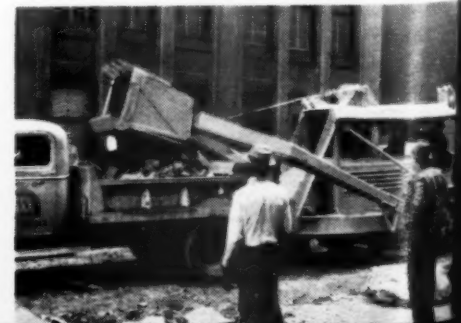
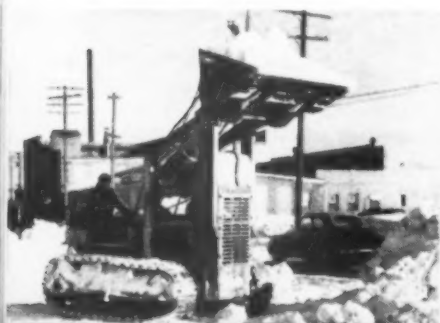
MATERIAL PITS. (Left): Oliver Cletrac Model D tractor equipped with Drott Hi Lift loader. (Center): Hough loader of latest streamlined design. (Right): Scoopmobile handling material with numerous boulders



SNOW LOADING with Caterpillar-mounted Traxcavator, heavy duty unit designed for year-around use

SOFT OFF-ROAD GOING. Bucyrus-Erie dozer-shovel mounted on International TD-9 tractor dumping 1-yd. load

RIPPING UP PAVEMENT. Sargent overhead loader mounted on Oliver Cletrac. This machine drops bucket, shoves to load, and swings bucket in arc overhead to unload as shown



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SPECIAL BOOMS. One of many types. (Sargent loader, Oliver-Cletrac)



PICKING UP BOULDERS. Ware hydraulically controlled bucket mounted on Oliver Cletrac



CLEARING AND GRUBBING. Same unit, which has forked bucket lip, handling stumps



SERVING AGGREGATE PLANTS. Case-Lull unit filling low-level receiving hopper at crushing plant, for maintenance gravel



CHLORIDE MATERIALS. Winter stockpiling and loading of sanding trucks is an ideal chore for loaders. (Hough-International)



LEVELING AND CLEAN-UP. Crawler-tractor designed for work in rough or soft ground. (Drott Skid Loader)

Loader Attachments Often Available Today

- Rotary broom
- Backfill blade
- Bulldozer
- Cargo lift
- Spall fork
- Crane arm
- Side boom
- Grapple hook
- Mowing equipment
- Boring devices
- Snow plow
- Snow bucket
- General purpose excavating bucket
- Backhoe
- Winch
- Log loader rack
- Shoulder clean-up bucket

reach, more positive clutch control of dumping, better visibility, more power, better balance, sturdier construction generally. Owners of older models often need to check into the performance of newer machines and revise their thinking as to output, unit cost of work, and adaptability of loaders to the work at hand.

Heavy Grading and Maintenance. Larger units, some of which are mounted on the heaviest tractors, can be used for quite heavy grading and materials loading. Loading of thou-

sands of cubic yards per week into trucks is reported for individual units, working in windrowed material or under other circumstances favoring high steady hourly output. In such steady operations the operator must learn to plan his maneuvers and spot his incoming trucks so as to achieve the shortest possible cycle.

Stockpile Loading. Perhaps the most common assignment of loaders is at stockpiles. Tasks for which they are particularly suited include dozing into traps, shoving material up to the clamshell, loading stockpiled material into dump trucks, loading into low-level batch bins, and general clean up. For this purpose the machine may be fitted with a general-purpose bucket, or an over-size bucket if working in light material.

Road Maintenance. After discussing loaders with various highway maintenance men the **ROADS AND STREETS** editors feel that the largest undeveloped field of use for loaders in general is roadside and shoulder maintenance. Wheel type units, particularly when mounted on dual rear tires, can handle many off-the-road

chores, such as ditch cleaning in conjunction with motor grader or heavy dozer and dump trucks; opening up clogged culvert inlets and drainage lines; clearing small slides; filling in shoulders; taking up sod in conjunction with shoulder re-shaping; and so on.

On the Pennsylvania Turnpike, for example, one manufacturer reports that several of their loaders equipped with excavating buckets are used regularly for cleaning up the slides that occur each year. This work keeps the machines busy in the fall and spring months. Then in winter the same machines, equipped with snow buckets, work around the mouths of the seven tunnels on the Turnpike, and at the road's fifty or more bridges. They are also used for loading sand into spreader trucks for de-icing work.

One Eastern highway department, reports this same manufacturer, uses 35 of their units on general maintenance. The machines are put into pits for gravel loading. They are equipped with bulldozer blades in summer, and snow plows or snow buckets in winter.

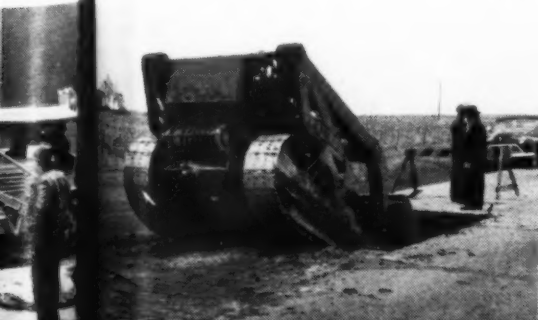
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PAVEMENT REPAIRS. Illinois repair job. Contractor used Drott loader here to remove broken-up slab and clean subgrade

DITCH CLEANING. Dual-tired unit quickly loaded 20 truck loads of material which was dozed and bladed out of couple hundred feet of clogged roadside ditch

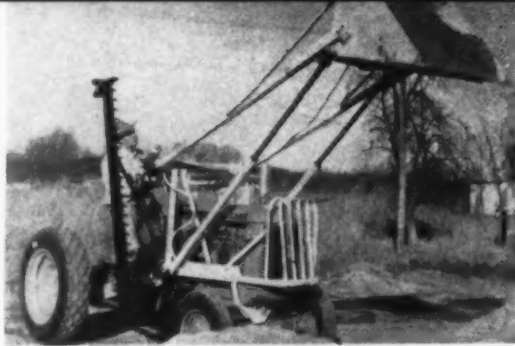
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overhead
machine
s bucket





CLEARING SLIDES. Small slide along US 40, Colorado, being cleared by mobile unit which can cover widely scattered spots (Wagner Scoopmobile)



DOUBLE DUTY. Mower attachment mounted on a Case tractor which also has an Ottawa loader, as used in Frank- lin County, Kansas



JACK-OF-ALL-TRADES. Underground gasoline tanks being set by a Sargent- Oliver-Cletrac unit



STOCKPILE WORK. Commonest of all jobs for loaders. (Minneapolis Moline equipped with Lull unit)



SPREADING. Loaders can spread material as deposited, by backing slowly as shown; or spread material after placement by dragging bucket lip



ROAD RECONSTRUCTION. Old asphalt crust being ripped up and loaded at rate of 60 cu. yd. per hour. (Athey ML4 Mobiloader)

Many county-owned machines of one make are equipped with a special shoulder bucket to pick up the windrows of debris thrown out of the ditches in the spring by the motor graders. The machines tie up only one lane, if any lane at all, in doing this work.

Crane Lifting Service is frequently performed with loaders, as a side duty or as a year-around assignment. Equipped with a sling fastened to a corner of the bucket, perhaps, for temporary jobs, or fitted with side boom, or a crane hook in place of the excavator bucket, the machine is seen handling lumber, machinery castings, culvert pipe, road forms, etc., etc.

Special attachments or auxiliary equipment is coming into more frequent use in connection with crane duty. This equipment includes the simple hoist arm and winch, grapple, log loading rack, special cargo lifts (designed for sling loads of posts, poles, etc.), and so on. Some units have a side boom, used in conjunction with the front-end mechanism.

Trenching and Backfilling. Some makes of loaders can be equipped with light backhoe attachments for trenching for water and sewer lines, culvert replacements, and other trenching where a light rig will suffice. The same machine or a companion machine equipped with a dozer or backfilling blade then backfills, perhaps in the meantime serving as a crane to unload

and set pipe, manhole materials, catchbasins, fire hydrants, and other such units.

Of course all this work is also commonly done with other types of equipment than loaders. The point here is that a loader, once purchased and brought to the job, can do any or all of these tasks, teamed up with an excavator or trencher, or virtually alone if need be, depending on the nature of the job and the equipment readily available. Side booms also fit in with this type of work.

Municipal Work. In addition to such of the above mentioned jobs that applies to municipal work, loaders can do general clean-up of leaves, rubbish, and storm washings; bulldoze or load trash and garbage, handle coal and ashes at municipal incinerators and utility plants, serve sanding trucks, and perform light grading and reshaping of outlying streets. Then comes winter, snow buckets or light

plows are fitted on the machines.

Pavement Repairs. Loaders of heavier design are used to pry or rip up old brick or asphaltic pavement materials or loosened concrete and stone base, in conjunction with rippers or power shovels. The same machines, with a general purpose excavator bucket in lowered position, can perform shallow grading for pavement patching, and tow small portable concrete mixers, compressors, etc., around the job in the absence of trucks or trailers.

Mower Duty. One of the most common double-duty assignments of wheel-type tractors equipped with front-end loaders is that of grass and weed mowing. Several state highway departments have large fleets of mowers where the cutter bar is an alternate attachment with a general purpose excavator bucket. There is some division of opinion as to the economy of doubling up on equipment in this manner. One state highway maintenance leader feels sincerely that his machines are designed for one intended purpose, and will last longest and serve with greatest ultimate economy if confined only to this one duty. Mowers especially are often considered in this light. But such thinking is in the minority.

Other Uses. Loader equipped wheel or crawler tractors are sometimes fitted out with rotary brooms, power augers or boring equipment.

Routine towing of shoulder drags,

Studies made in Virginia ["Mechanical vs. Hand Loading," by J. J. Forrer, Jan. '49 R & S] show that the costs and the savings do vary widely, but that careful use of power loaders with highway maintenance trucks permit surprisingly large reductions in unit costs. In the Virginia studies, for ditch cleaning work, savings varied from \$76 to \$431 per mile over hand methods.

and emergency towing of all manner of equipment, is done with loaders.

A small soil stabilization job was observed recently in which two wheel-type tractors and a crawler tractor fitted out primarily for loader service were used variously to draw a sheepsfoot roller, a pulverizing mixer, a harrow, and a pneumatic roller, then to perform clean-up work and finally scoot back to the material yard afterward to resume their regular duties.

"Motorized Tools" Concept

C. L. Motl, maintenance engineer, Minnesota state highway department, is an enthusiastic believer in loaders. In stating a belief that power loaders are the "most revolutionary equipment in recent years," his department makes use of $\frac{3}{4}$ -yd., $\frac{1}{2}$ -yd. and $\frac{1}{4}$ -yd. loaders of several makes throughout the various state maintenance districts.

His enthusiasm stems from several guiding principles used in planning work and purchasing equipment, outlined as follows:

1. The concept of the "motorized hand tool" in general offers a tremendous opportunity today to step up maintenance work in existing funds. Loaders come under this classification, as do any units that represent the replacement of a manual labor operation. The term, he notes, goes well beyond hand-held tools. Small power loaders can be operated by a single worker on many chores, even by the drivers of the trucks which it fills.

2. All possible equipment should be multi-purpose in order to get maximum use per year per machine. In Minnesota, for example, small pneumatic tired highway mowers (Case, etc.) are ordered delivered with front-end loader equipment attached. The tractors are thus extensively used all winter and spring to load stockpiled, chloride-treated sand, cinders and other abrasives, the truck driver usually operating the loader. Then comes early summer and the loader attachment is detached, mower equipment added and the machine keeps on working.

3. A machine for maintenance should be purchased to fit job needs,

rather than buy a machine and then hunt work for it. Where the latter course is followed it is easy to get into inefficient operation, he feels. Decision to employ small loaders in Minnesota is based on their successful try-out on different familiar tasks, such as loading from stockpiles, service around sand and gravel pits, loading stock-piled cold-mix for patching, light shoulder and ditch work, loading snow, etc.

4. Most maintenance equipment should be purchased with an eye for flexibility, low operating cost and low investment or ownership cost, rather than high production. Maintenance work more frequently consists of small dabs of work at many locations.

Favors Small Gangs

5. Small gangs rather than large, in general, afford the greatest flexibility and economy in highway maintenance work. Large scale operations "must find work for themselves" and possibly minor but essential maintenance needed in a thousand locations may be neglected. Such mass work could preferably be done by contract.

In any event, the "thousand locations" idea comes near actual conditions, since roadways and shoulders need constant spot attention all over the highway system. "Motorized power tools," such as loaders—to come back to the point of this discussion—help deploy workers more effectively and plan tasks more flexibly.

Mr. Motl was asked to contribute examples of actual unit costs of loader work or other motorized tasks, but countered with a point of view worthy of serious thought. It is difficult to develop cost figures that mean anything on spot work unless a full understanding is had on what they include. He therefore hesitates to try. Any figures that are segregated, however, should definitely include overhead, equipment rental, moving time, and all other factors. We do know, however, that one or two men with power tools now do more work and do it faster than several men formerly by hand labor, and rental charges for equipment are less per hour than labor it replaces.

FORK ATTACHMENT. Fine for cleaning up and handling oversize (Traxcavator-Caterpillar). Courtesy Calif. Division of Highways

TRENCHING. Backhoe mounted on a loader in place of the usual bucket



GOOD TRUCK SUPPORT as shown here helps capitalize loaders fully. Second truck ready the instant nearest truck loaded. (Allis-Chalmers HD-5G tractor with Tractor-Shovel)

Toll Roads Spread to Three More States

Legislative proposals authorizing construction of toll roads have been enacted into law in three more states, are pending in six states and have been defeated in four, as revealed in a recent survey by the National Highway Users Conference.

The Colorado law provides for the cost of the turnpike project to be defrayed by bond issues with up to 30% of the annual cost pledged from highway user revenues. It also declares such turnpikes to be "public highways of the state," which declaration apparently is designed to circumvent the anti-diversion constitutional provision.

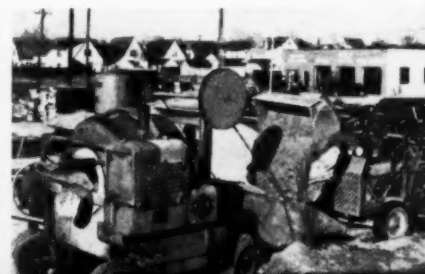
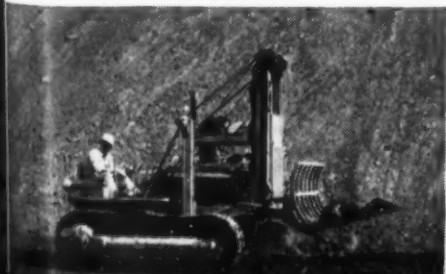
New Jersey's first toll road, cost estimated at \$85,000,000 is authorized in a law defining the main route from New York state line to connect with a proposed new bridge across the Delaware River near Deepwater, totaling 130 miles. Another law authorizes construction or taking over of any feeder routes to the toll road.

Organization of "municipal corporations" to construct and operate toll roads is authorized by legislation enacted in North Carolina. The corporations have power to condemn right-of-way not to exceed 100 feet in width, and issue revenue bonds for financing the project.

Legislation which has passed the Senate in Ohio would create a Turnpike Commission to construct and operate toll road projects financed by revenue bonds. A Pennsylvania measure, having passed both Houses, would authorize a turnpike from Scranton to Harrisburg connecting with the existing Turnpike. Companion bills in California, one of which has passed the House, would authorize bridge and highway districts to acquire or construct toll roads connecting with any toll bridge owned and operated by such districts.

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FEEDING SKIP. Emergency service of this kind is one of many off-the-beaten-path jobs that a loader can do handily



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New Roadside Methods

How the Ohio department of highways is stepping up efficiency of roadside maintenance with commercial and special equipment



1 Hole digger mounted on a tractor can go anywhere and operate on slopes

By W. J. Garmhausen

Landscape Architect, Ohio Division of Highways, Columbus

MUCH thought has been given to time-saving methods in Ohio's roadside landscaping program. Here pictured and briefly described are ten of our more successful equipment items.

1. Mechanical Hole Digger

The mechanical hole digger operates either from a tractor or jeep power take-off. The vehicle is mobile and will function on slopes as steep as 2 to 1, as well as flat areas where holes are to be dug.

Auger bits can be supplied up to



18-in. size. Larger holes can be partly dug with this outfit by digging a number of smaller holes as close together as can be managed.

The extra dirt can either be thrown out by hand or else the auger holes bored deeper than required. The extra dirt may be used to bring the bottom of the holes up to required depth. This equipment will not work in stony or wet soil. Its maximum depth of operation is three feet.

2. Pulverizing Mixer

The mixer can be used to prepare the seed bed and in "tying" down the straw mulch.

This machine is propelled by a

crawler tractor large enough to pull it steadily. The rotary tines, which revolve inside a metal hood, are driven by a gasoline motor. It is 6 ft. wide and will pulverize the soil, working it into a good seed bed. A shovel attachment fastened to a sliding shoe governs the depth of the cutting of the tines. The lower edge of the sloping hood of the steel box smooths and levels the soil as the machine moves forward.

The machine passing over the mulch incorporates it with the soil, keeping it in place until the grass is tall enough to accomplish this. Can also be had in the 3 and 4-ft widths and they also can be had to operate from a power take-off.

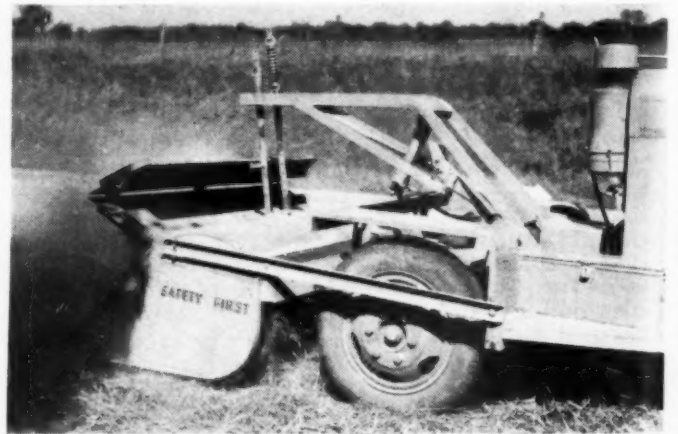
3. Sprayer

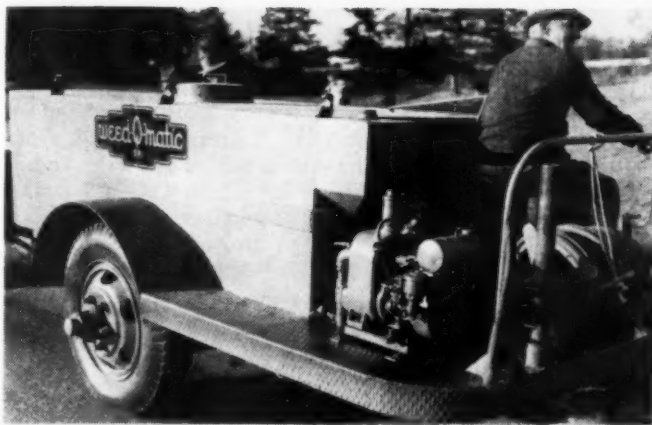
This sprayer can be used in chemical weed control. It is a low-pressure, low-gallonage sprayer. It can also be used to apply liquid fertilizers.

Has a metal tank of 100-gal. capacity. The motor is a 1 1/4 h.p. Briggs and Stratton motor which will deliver up to 70 psi. pressure at the pump. A broom, spray bar, or hand gun can be used for spraying. The size of the nozzles depends upon the amount of liquid you wish to use per acre. For weed control purposes this machine is equipped with nozzles that deliver 5 gal. of spray material to the acre, traveling at 4 mph. This machine works well when the vegetative growth is short (early spring), and little material is necessary to get an effective kill. The advantage of this



Pulvimixer is a good machine for working hay into the soil after seeding





3 Mechanical weed spraying equipment today covers large areas quickly, uniformly and cheaply

machine is that one tankful of material will last all day and no refilling is necessary.

4. Grass Seed and Fertilizer Spreader

Used for applying fertilizer and grass seed where large areas are to be seeded; the machine has one compartment which is divided into two sections. The rate of application is governed by the size of the openings. This is easily regulated by a lever. The agitator is run by means of a chain connected to a sprocket wheel attached to the axle of the rollers. The two outside rollers are welded to the axle. The seed and fertilizer falls to the ground directly from the material compartment and is covered by means of a harrow-like attachment. This is attached to the frame of the machine and fits directly behind the compartment.

A roller which is divided into three sections completes the outfit, and firms the seed bed. This machine can be used on moderate slopes. It does not operate as well on extremely windy days because seed and fertilizer blow and result in an uneven distribution.

5. Straw Blower

This is used to mulch newly-seeded areas. The machine is an ensilage cutter with the cutting knives removed. A small motor turns the cylinders, revolving belt, and fan.



4 Seeder in operation. Grass seed and fertilizer being applied

The endless belt feeds the straw into the hopper. A cylinder above the endless belt revolves also and helps feed the straw into the hopper. A hand lever controls the speed of the machine.

A second cylinder in the hopper is supplied with steel fingers which help pull the straw into the hopper and break up any remaining bunches of straw. The fan blows the straw into a pipe which directs the straw to the area that is to be mulched.

A longer pipe can be used to reach greater distances. A hood attached to the end of the pipe is worked by means of a rope attachment. By lowering the hood the straw is deflected so it will not carry far. By this means all areas are covered. The machine will mulch slopes as well as flat areas, and does this in much less

time than if it were placed by hand. It puts down an interlaced pattern which does not blow readily.

6. Grass Roller

This is used to roll grass areas that are high—caused either by frost action or added top material, or to roll newly-seeded areas.

The roller is built within a "Y" shape frame. An axle with four right-angle bends carries through the roller, frame and wheels. It is welded to the frame so that it is rigid. When the roller is not in use, it is transported on the attached rubber-tired wheels. When the roller is in use the frame is tipped up and over the roller, which brings the wheels to rest above the roller. The roller is kept clean by means of a blade which can be adjusted by tightening or releasing

5 Straw blower—looks like a threshing machine, but does the work





6 Rollers of this type help compact sod shoulders at low cost per mile



7 A rather unusual use for an elevating grader, but why not?



8 Log gin being demonstrated on a sappy log, in conjunction with power saw



9 Truck units with brush chipper are an important new labor saving development

the tension on the springs. The roller can be pulled directly behind the mower or to one side. A 6-ft. bar is attached to the outfit and a chain which is fastened to the drawbar and the axle of the mower governs the position of the roller. The longer the chain the more directly behind the mower the roller will follow.

7. Elevating Loader

An elevating loader or grader is used to load soil into trucks. The machine is a tractor-like outfit with a shovel attachment at one side which can be set to cut one foot deep. The soil is pushed back on to a moving belt by the forward motion of the tractor. The revolving belt carries the dirt up and out to the end, where it is loaded into trucks. This is a fast and economical means of loading soil.

8. Log Gin

It is used to hold up tree trunks. The apparatus is a two-legged affair that straddles the tree trunk. The



legs are detachable. The bar is balanced in the center by a chain which runs to a ratchet wheel attached to the top of the gin. The ratchet wheel is operated by a hand lever which raises or lowers the trunk.

The tree trunk is kept in place by another chain that goes around the trunk and fastens in notches in the

bar. Special hooks are used on the ends of this chain which fit securely on the notched bar. The notches keep the chain from slipping.

The gin is very useful in sawing up tree trunks. It keeps the trunk from binding and pinching the saw, and it also keeps the log in a good working position. The commercially-made unit pictured has storage space for ladders and tools. There is also provision for an aerial ladder off the top of the body.

9. Chipper or Brush Cutter

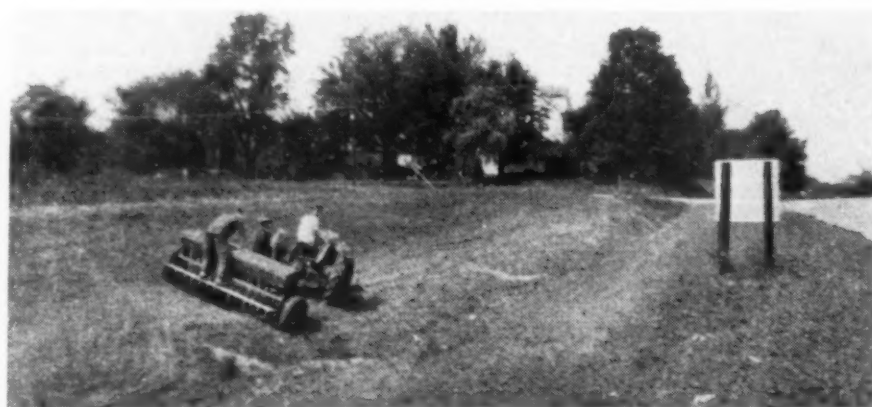
It is used to cut up brush from tree trimming. This machine is powered by a separate motor, and brush is fed into a metal chute. A series of blades cut brush into chips or pieces which are blown into another compartment for storage. These chips can be used for mulch or walks, etc.

10. Seed and Fertilizer Drill

It is used for seeding roadsides or any other areas needing seeding or fertilizing.

The machine is a 14-hole drill and is made up of three compartments. Commercial fertilizer is placed in one compartment. When alfalfa, clover, hairy vetch, or any other heavy seed is included in the seed mixture they are placed in the second compartment. When several types of lighter seeds are mixed together they are placed in the third compartment. The tubes leading from the third compartment can be pulled free from the chute to the disc so that these small seeds can be broadcast. If this procedure is followed a piece of link fence should be attached to the drill to cover the seeds.

A "cultipacker" can be substituted to cover the small-type seed and it will also firm the seed bed. Legume seeds that have been inoculated are easier to handle if they are not mixed with the other seed, so the two compartments for seed have their advantage. The drill also allows the heavier seeds and fertilizer to be planted deeper.



10 Seed and fertilizer drill at work

Barber-Greene

★★★★

PRTD. IN U. S. A.

B-G COST SAVING BULLETIN No. 4903

★★★★

115M AM-5-49

ILLINOIS CONTRACTOR DEMONSTRATES PORTABILITY OF NEW ASPHALT PLANT

MAKES FOUR DIFFERENT SET-UPS IN FOUR MONTHS TO HANDLE NUMBER OF JOBS



Ottawa, Ill.—The cost-reducing advantages of modern portable mixing equipment has been well proved by the J. P. Wetherby Construction Co., prominent local road contractors. In one season, their B-G Utility Plant operated near Lowell, then moved 30 miles to Spring Valley, 40 miles to Streator and another 40 miles to Sheridan. The work under contract consisted of several comparatively small and scattered jobs for the Illinois State Highway (specification type C-6). Officers of the J. P. Wetherby Co. realized that to handle this class of work profitably would require a plant that could be moved quickly and economically to various operating sites in order to minimize trucking distances. The Utility Plant with two-bin aggregate control was well suited to their needs. The Utility Plant includes a combination Mixer-Gradation unit mounted on a semi-trailer chassis; a Dryer, also mounted on a semi-trailer chassis and equipped with built-in Hot Elevator which reclines for transporting; a Cold Elevator and Reciprocating Feeder. Mixer and Dryer are equipped with adjustable jacklegs which eliminate cribbing and the Dryer has a high Roto-discharge which eliminates deep elevator pits. The Utility Plant is also available with a four cyclone Dust Collector which is mounted on a trailer chassis. Wetherby decided that for this work no dust collector was needed since there was no serious dust condition.

The plant was set to operate at 50 tons per hour, but as soon as production was well organized, the capacity was increased to 63 tons per hour and output was maintained at this rate.

Jefferson County Starts Fourth Season with B-G Plant and Finisher

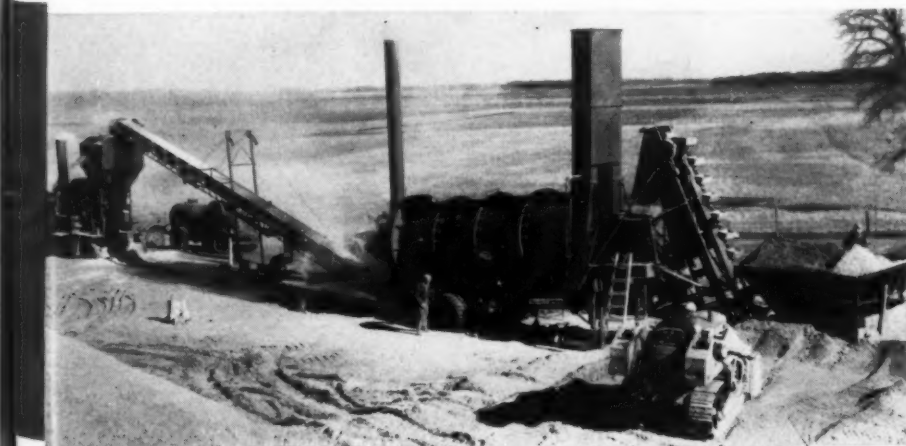
Jefferson, Wis.—Jefferson County highway authorities have found the answer to their road construction and maintenance problem in their "team" of Barber-Greene, which consists of a B-G High Capacity Bituminous Plant and a B-G Finisher. After getting a late start in 1946, this team has seen full seasons of action thereafter. In 1947, it worked from June through most of December; and in 1948, it produced 42,193 cubic yards between April 19 and November 27.

Longer Work Season Possible

The Jefferson County Plant consists of a Mixer, Conveyor and Dryer and a 4 yard shovel for supplying the Elevator Hopper. They have found the Dryer highly satisfactory because it helps materially to lengthen the season. J. A. Perry, Highway Commissioner, reports that this team has mixed and placed material over old concrete, much over old black top and some over gravel road surfaces. Typical daily performance, with one man on the Mixer, one each on the Dryer and Conveyor, was 526 cubic yards in 416 minutes.

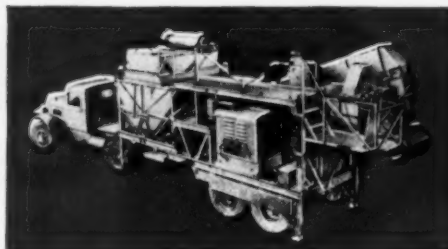
Most of their yardage has been laid by their B-G Finisher which consistently demonstrated its ability to lay a smooth compacted surface in minimum time, with minimum manpower.

Jefferson County's B-G High-Capacity Plant



848530

Portability of this B-G Mixer-Gradation Unit is duplicated by the other basic Utility Plant units.



84835

73,000 TONS OF HIGH TYPE MIX FOR OKLAHOMA HIGHWAY 76

PRODUCED AT UP TO 133 TONS PER HOUR RATE BY B-G HIGH CAPACITY PLANT

Lindsay, Okla.—There is a fifteen-mile stretch of new asphaltic concrete in Highway 76 near here that attests to the efficient operation by Dahlgren-Brooks, contractors, of their B-G High Capacity Bituminous Plant and B-G Finisher.

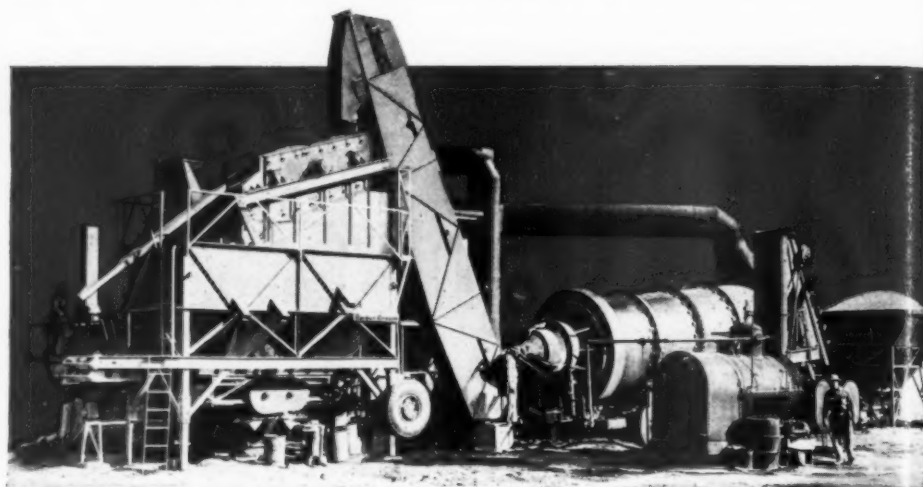
Requiring 73,000 tons of high type mix, this job called for 7 inches of asphalt to be laid to a width of 22 feet on a base made of old oil mat which was scarified and shaped to grade. The mat was built in three layers, two of 2½" with a 2" top course. The B-G Finisher made the three passes and was kept supplied by the B-G Plant which operated at 133-ton per hour rate on binder material and 120-ton per hour rate for the top course.

MECHANICAL DIFFICULTIES NON-EXISTENT

For the first 35 days of operation, records showed a total output of 33,815 tons for an actual hourly average of 107.3—which includes time lost waiting for trucks and delays from other sources. Much of the credit for the smooth plant operation was the result of the 4-bin cold feed which allowed the sand and crushed stone aggregate to be fed accurately to the dryer in four separate sizes under rigid control from bins and feeders.

While this B-G Plant is a high capacity plant for jobs requiring large volumes of material, it is nonetheless highly portable, capable of being dismantled, transported and reassembled with maximum speed and economy.

Dahlgren-Brooks' B-G Finisher shown resurfacing Highway 76 about 50 miles south of Oklahoma City. Note open traffic lane.



Maine Motorists Now Enjoy Part of World's Longest Asphaltic Super-Highway

Main Turnpike, Maine—Destined to be one of the world's outstanding engineering achievements, the Maine Turnpike is already proving itself to motorists who are using the first fifty-mile section to be built on this ambitious project. This section, built at a cost of 20 million dollars, consists of a 300-foot wide right-of-way, a 94-foot roadway with two 24-foot paved strips and a 26-foot center parkway. Over 4,500,000 yards of borrow material were required and asphaltic materials were needed to the tune of 365,000 tons of asphaltic concrete base course, and 145,000 tons of surface course.

B. Perini & Sons, one of the country's leading contractors, mixed most of this material with two B-G High Capacity Plants with Multiple Aggregate Control. These plants have a combined capacity of about 230 tons per hour. Each of the Mixers was positioned in order to discharge into a common surge hopper to permit continuous operation of both plants, regardless of availability of trucks.

Actual laying of the roadway was accomplished with five Barber-Greene Finishers, which frequently operated in tandem. The base course consisted of two layers, each 2½" thick, and this was covered with a 2" surface layer. The B-G equipment operated with fine success on specifications calling for asphaltic cement of 85-100 penetration and an aggregate with a maximum size of 1¾". A plan view of a typical B-G High Capacity Plant setup is shown above which illustrates the compactness and relative simplicity of the type of B-G mixing equipment used by B. Perini & Sons on this notable job.

Maintenance Plants Cut Budgets for Many Cities and Counties

MAKE BITUMINOUS SURFACING MATERIAL AVAILABLE and PRACTICAL

Crown Point, Ind.—City officials here are highly pleased with the cost-reducing performance of their B-G Maintenance Plant, as witnessed by a letter from Mayor Erlenbach, who said, "Since the plant has been put in operation, it now costs the city about half as much to resurface a street with an asphaltic concrete mix as it did before, using an inferior mixture. Your equipment is sturdy, and requires only routine maintenance. As a result of our experience, I highly recommend B-G equipment."

Crown Point's B-G equipment consists of a Mixer, Dryer, Two-Gate-Feeder, and Charging Hopper. Their experience is typical of many rural towns whose location is such that contractors' services are not generally available. Such cities are finding that purchase and operation of B-G Maintenance Plants is the most practical and economical way to build and maintain city streets, parking lots, tennis courts, etc.



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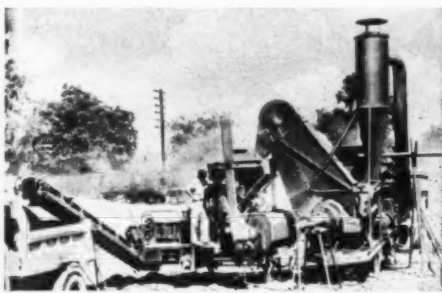
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B-G PLANT SOLVES COTTON WAREHOUSE PAVING PROBLEM

Yazoo City, Miss.—A unique paving job has been completed here to successfully solve the problem of warehousing cotton under dry, rodent- and termite-proof conditions. Formerly, in the huge cotton warehouses of the Federal Compress Co., cotton bales were stored on plank floors exposed to inroads of moisture, rats, termites, etc. To minimize such losses, the company called on W. J. Runyon & Son, contractors, to place asphaltic flooring in warehouse interiors and to pave driveways, parking areas, and runways.

Runyon purchased a B-G Maintenance Plant, set it up in the center of the area to be paved, and produced a 6% asphalt cement, 150 penetration, at the rate of 20 tons per hour. The result—a solid asphaltic flooring throughout the entire storage area that has conquered the rodent menace—and a virtually untouched field of prospects for many contractors who own or purchase B-G Maintenance Plants.



Fergus Falls Stretches Paving Dollars

Fergus Falls, Minn.—In the first 29 days this city operated its B-G Maintenance Plant, it produced 3925 tons of mix in 167 working hours—at a cost that saved the city well over 10% on its paving and maintenance program.

This community of 11,000 again emphasizes the fact that small communities, remote from large urban areas, often cannot obtain the services of experienced asphalt contractors. B-G Maintenance Plants fill this gap admirably and make possible broader enjoyment of paved streets in the smaller towns.

Roseburg, Ore.—Only three days between setups 23 miles apart—that's what Roseburg Paving Co. reports as normal procedure with its B-G Maintenance Plant. This, the firm head states, includes time for dismantling, traveling and reassembling the Plant.



Barron County, Wis.—Elmer R. Rogers, County Highway Commissioner, reports that on one job the County's B-G Travel Plant produced the mix for 13½ miles in 159 hours, and further points out that such performance is not exceptional for his Barber-Greene equipment. Normally, the plant averages 100 cubic yds. per hour but has done as high as 120 cubic yds. an hour. Last season, it produced 53,000 cubic yds. County roads take about 1,000 cubic yds. per mile. The plant is used both on the road and for stockpiling mix during slack seasons.

41 MILES IN ONE SEASON FOR THIS TRAVEL PLANT

Chippewa County, Wis.—Back in 1947, the County purchased a B-G Bucket Loader, and less than a year later had piled up a record of 75,000 cubic yds. loaded. At this time it was converted to a Paving Loader and a B-G Travel Plant Mixer was purchased. Last season, this combination placed 41 miles of new surfacing for the county—on one job completing 22½ miles in 17 working days.

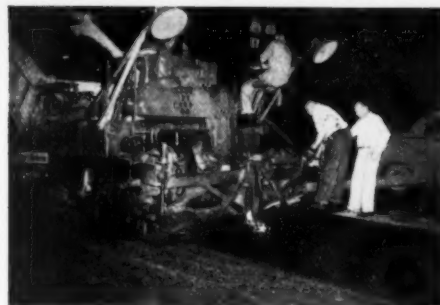
GET DOUBLE DUTY FROM THIS BUCKET LOADER

Mr. Taylor, County Highway Commissioner, points out that in spring and



fall the Bucket Loader is used as a loader for stock pile work, averaging 1,000 yards in a 10-hour day. This is chiefly gravel for repairing gravel roads. The B-G Loader is an additional asset to Travel Plant owners for, when not used with the Travel Plant, it is widely useful at all regular loading operations.

B-G FINISHERS WORK "NIGHT SHIFT" TO MAINTAIN TRAFFIC



COURTESY OF MICH. STATE HWY. DEPT.

Detroit Resurfaces 12.6 Miles of Arterial Street

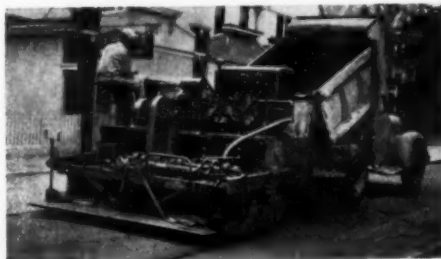
Detroit, Mich.—This city's Grand River Avenue now has a potential capacity of 55,000 cars per day, thanks to its recent resurfacing project, which was carried on almost entirely at night because of the need for maintaining heavy daytime traffic during construction. B-G Finishers laid 12.6 miles of pavement, much of it over old streetcar tracks—at the rate of 300 tons per night on track areas, and 500 tons per night on full width areas. Fast moving jobs such as these highlight the advantages of B-G Finisher operation.

B-G Finishers spread material evenly, compact it to a uniform density, and automatically compensate for the variations in the sub-grade. They lay a smooth surface which requires a minimum of rolling and is quickly ready for use with minimum interruption to traffic.

Portland Lays 1260 Tons In 9 hours with Finisher

Portland, Ore.—This city has reason to be proud of its record made recently with its B-G Finisher when it laid 1,260 tons of Amiesite—a 1½-inch thick mat—in 9 hours' time. This B-G Finisher averaged 802½ tons of assorted asphalt paving material placed in each 8-hour shift throughout the 1948 paving season. This includes surfacing rough streets with 1" to 2" layers and other routine maintenance work.

Many cities all over the world have found the B-G Finisher to be an invaluable maintenance tool, equally useful for new construction as well as maintenance jobs, including resurfacing city streets, large areas such as parking lots, tennis courts, etc.



FOR COST-REDUCING EQUIPMENT, CALL **Barber-Greene**



B-G BUCKET LOADERS: Crawler or pneumatic-tire mounted. For low cost truck loading of bulk materials. Capacities up to 3 cu. yd. per min.



B-G DITCHERS: Crawler and pneumatic tire mounted, for digging trenches from 5½" wide, 4' deep to 24" wide, 8' 3" deep.



B-G PERMANENT CONVEYORS: Complete, standardized equipment including carriers, take-ups, drives, frames, etc.



B-G PORTABLE CONVEYORS: For moving all bulk materials and packaged goods. Variety of lengths, belt widths, and capacities. Electric or gasoline power.



SNOW LOADERS: Pneumatic tired loaders for removing up to 20 cu. yds. per minute. Convertible to Bucket Loaders for summer work.



B-G COAL YARD EQUIPMENT: Belt and chain-and-flight Portable Conveyors; self-propelled, pneumatic-tired. Also, hopper-car Unloaders.

TIME is MONEY!

B-G Equipment Saves TIME

Turning costly man-hours into low-cost machine-minutes is good business. Barber-Greene has been designing and building time-saving equipment for more than 30 years. "Built by Barber-Greene" means extra values — extra value in design principles, workmanship, and materials to do a better job, at lowest cost, with minimum maintenance expense.

Your B-G Distributor has the knowledge and ex-

perience to provide you with expert equipment application advice. When you discuss material handling with him, you can rely upon the recommendations he makes.

Barber-Greene Distributors have factory trained service men who are ready to render you the maintenance service you require.

Barber-Greene Company
Aurora, Illinois
Cable address "Bargreene"

Send information on the Barber-Greene indicated below.

- ☐ B-G Mixing Plant for producing _____ T.P.H. of _____ type of mix.
- ☐ Finisher
- ☐ Heavy Duty Bucket Loader
- ☐ Travel Plant
- ☐ Other B-G Equipment
- ☐ Have a representative call

Name _____

Firm Name _____ Position _____

City _____ Zone _____ State _____

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Send This Coupon!

The coupon will bring you complete information on any Barber-Greene machine without cost or obligation.

We will be glad to have our representative call to discuss your material handling problems with you.

We maintain a Department for the sole purpose of solving your material handling problems.

BARBER-GREENE COMPANY
Aurora, Illinois

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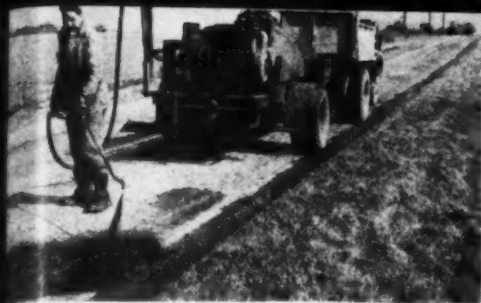
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ROADS and STREETS READER SERVICE



★ Note special demountable platform attached back of the tailgate. Located knee-high, this device saves shoveling time and effort



★ New Ford trucks, decked out with blinker lights, flags, side driving mirrors, and extra driving lights, are the nucleus of this modern Ohio bituminous patching outfit

Bituminous Patching

—the modern way at 2 to 4 miles per day

PICTURED here is an example of a familiar type of road repair which has been greatly stepped up in speed and efficiency by use of modern equipment. The bituminous patching shown was being conducted during March this year on S.R. 182 in Wyandot County, Ohio. This route is being used as a detour for passenger cars for U.S.R. 30-N while that highway is being reconstructed for a distance of ten miles east of Upper Sandusky. The maintenance crew photographed operates from the state highway garage, Wyandot County, which is a part of Division No. 1 with headquarters at Lima, Ohio.

Four trucks were used in this working unit. One truck was used to tow the Littleford trailer type distributor, of 500 gal. capacity. Three trucks were used to haul the patching aggregate. These trucks were Fords with a two-ton rated capacity (Galion dump bodies) and the average haul distance was five miles. One truck for each 1½ to 2 mile haul is required to keep this type of hand patching operation moving steadily along.

★ Speed of the crew depends on capacity of distributor and amount of patching necessary. This unit is a Littleford of 500-gal. capacity

A patching crew of this size—consisting of two flagmen, two shovelers, hose operator, truck drivers and foreman—can patch from ½ to 4 miles per day, depending upon the condition of the pavement and the size of the distributor. This particular crew, on the day the pictures were taken, patched two miles of pavement. Several days' cost figures were checked and the average cost of patching this route was \$125 per mile, broken down as follows: Labor \$45; Material \$45; Equipment \$35.

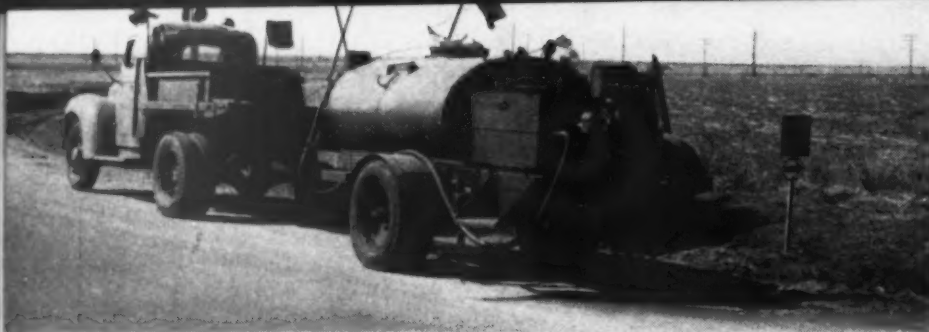
Bituminous material used was MC-3, a medium curing liquid asphalt with a 100 to 200 penetration re-



★ Part of the safety methods in Ohio is the liberal use of flagmen where traffic is heavy. This fellow is 1,000 to 2,000 ft. ahead of the crew

87





★ Typical 500-gal. tank trailer outfit used in Kansas for bituminous patching

Kansas Finds 500 Gal. Asphalt Trailers Economical

A FAMILIAR sight along Kansas state roads this time of year is the bituminous patching crew. It usually comprises a maintenance truck with a tow-type heater and distributor.

Following is statement from state maintenance engineer L. J. Siler on this equipment:

"We have 128 of these units and it is our ultimate purpose to assign one unit to every other bituminous maintenance section. Our bituminous maintenance sections average about 30 miles in length.

"The first units which we purchased some years ago were 300-gal. capacity, which was later changed to 400-gal., and our specifications now provide for a 500-gal. capacity, with 600-gal. acceptable.

"These machines consist of a one-axle trailer, on which is mounted an insulated tank equipped with heating flues and an air-cooled gasoline engine-powered pump. It is equipped with a spray bar on the rear, adjustable from 4 to 8 ft. in length and has a single nozzle spray bar with flexible hose.

"The unit is used to spot seal, on which operation the hand spray bar is used and it is also used to over-all seal comparatively small or narrow areas especially along edges. It is not extensively used for over-all sealing when a section of road of some length is being sealed, as this is generally handled by contract. The unit is also used to distribute road oil to aggregates in making patching material.

"All of our equipment is charged out on a rental basis and the operating rental used on this unit is 55 cents per hour.

"A break-down of actual average operating costs are as follows:

Oil costs	.0054
Grease	.0003
Tires	.0210
Repairs	.2505
Misc.	.0581
Fuel costs	.164
Total	.526 per hour

"Seven manufacturers have bid and furnished these units to the State Highway Commission. We find that this unit fills our requirements for this type of work and we believe that a unit of this nature is entirely essential for maintenance on bituminous type roads."

Bituminous Patching the Modern Way

(Continued from page 87)

quirement, applied at approximately 200°F.

This operation, although it was being applied early in the year, was intended to be a permanent repair. A non-stripping agent was added to the bituminous material to aid in holding the aggregate in the patch.

A 5-ton portable patching roller (not pictured) is used to compact these patches.

A notable feature of this operation is the thorough safety precautions. A flagman is stationed about 1000 ft. to the rear, where a "slow" sign is also set on the pavement edge. Another flagman works with the crew. All trucks are flagged and equipped with 2-way red blinker lights mounted at top-of-cab height on the front corner of the dump body.

This type of patching is a routine operation throughout the State of Ohio, according to L. F. Schaeublin, chief engineer, bureau of maintenance, who supplied the foregoing information.

17 Commandments for Safe Operation of Shovel and Crane Equipment

(Courtesy Link Belt Speeder Corporation)

1. Keep boom at least 6 feet in the clear of all overhead wires.
2. If the boom should come in contact with overhead wires:
 - a. Stay on the machine until the boom is cleared or the current cut off.
 - b. Keep everyone on the ground away from the machine.
 - c. If you have to leave the machine—jump, do not step off.
3. Everybody should stay from under boom or load while hoisting, lowering, crawling or turning. Use handlines for guiding long materials.
4. Never swing over ground crew men.
5. Never swing over a truck until the driver has left the cab.
6. Never overload buckets or booms.
7. Be sure that everybody is in the clear before backing up.
8. Be sure that all slings, ties, and hooks are properly placed and secured before hoisting.
9. Keep hands clear of cables feeding in on sheaves or drums.
10. Never try to get on or off machine while it is in motion.
11. Never clean or oil machine while any part is in motion.
12. Inspect cables and clamps once every week.
13. Shut off the power and lock all controls before leaving the cab.
14. Always rest the bucket or other load on the ground before leaving cab. Never leave them suspended in the air.
15. Take signals from only one man.
16. Always maintain machine in good operating condition, especially controls and brake systems.
17. Maintain all walk-ways on machine free of grease, oil and ice.

States Collect \$1,342,973,000 on Gas Tax—Motor vehicle operators in the United States paid a total of \$1,342,973,000 in taxes collected by the states on 30,646,486,000 gal. of motor fuel consumed in 1948, according to figures compiled by the Public Roads Administration from reports of state agencies. This was an increase of 2,239,428,000 gal., or about 8%, over the 28,407,058,000 gal. of motor fuel on which the states collected taxes at prevailing rates in 1947.



★ General view of the plant, and a look along one of the assembly lines

Caterpillar Dedicates New Modern Diesel Engine Factory

CATERPILLAR Tractor Co., Peoria, Illinois, has dedicated and geared for full production its new diesel engine factory at Peoria, said to be the most modern production site in the industry.

With an area of 925,000 sq. ft., the factory represents 4½ years of planning to convert from the planning boards a plant engineered for a specific operation, rather than a conversion of an operation to a specific type of building. The factory measures 1,120 x 757 ft.

The building, from its conception, was designed, erected and equipped expressly for the economic manufacture of the company's line of diesel engines. Designated as Building KK in the extensive expansion of Caterpillar manufacturing facilities, the structure houses facilities to produce all of the diesel engines, merchan-

dised as industrial power units, marine engines and electric sets, in the company's line.

Under One Roof

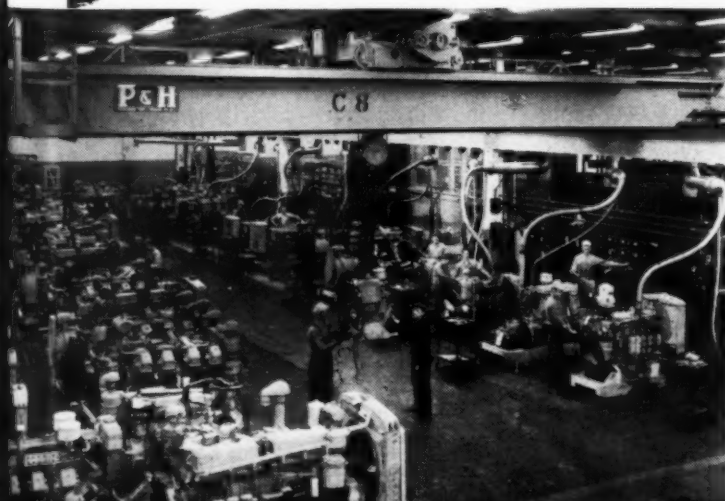
The company has built the building around the design, so that machining, testing, shipping and other related engine work has been accomplished under one roof. Time and labor are saved by proximity of adequate casting storage yard, rough storage area inside the building, numerous conveyors to move rough material from storage to the machine lines, proper width of aisles, an efficient industrial railroad layout, and the movement of material through an open inspection area. Suitable space is provided for storage of finished parts, and efficient use of bridge cranes, fork trucks and other related material is said to give this plant a flexible and efficient movement

of materials, meaning last word in modern mass production.

A fitting example of the ingenuity and engineering that went into the company's production is the fact that one man on the engine assembly line may work on 19 different engine models moving on a conveyor line.

The assembly area consists of three assembly lines for basic engines, two for erection, testing, painting and shipping of industrial engines, a test room and large areas for the storage of finished parts, both purchased finished and machine shop finished. All three basic engine assembly lines, running parallel, end in the same bay, where a bridge crane is used to remove the engines to a set of gravity roller conveyors along which they are moved by a drag chain into the test room and stored pending test.

★ Test area for industrial engines, generator sets and other specialties. Right: looking along the V12 cylinder block line, with hydraulic drilling and boring machines in foreground





★ Bell housing line, drilling section



★ More acres of efficiency—rough storage area, 100 x 1040 ft.

Modern Test Room

The test room, adequately lighted, ventilated and elaborately sound-proofed, is arranged in two banks of test cells, each bank serviced by a bridge crane to install engines from the conveyors and to remove them to the out-going conveyor to one of the two adjustment floors. There fixtures and gantry cranes have been provided to expedite necessary tear-down and adjustment work. The 21-celled area has the capacity to test two engines at a time in each cell. Its design provides the space and type of construction which promotes cleanliness, safety and efficiency. Engine exhaust in this new test room is dissipated through mufflers extending through the roof. All other service connections necessary when installing the engine on the test block are made to lines brought up through the floor from a basement extending under the entire test room.

Of the 925,000 sq. ft. floor area some 425,000 sq. ft. is devoted to machine shop. All of the area is on one floor with the exception of 156,000 sq. ft. on a T-shaped mezzanine above the main floor and 25,000 sq. ft. in a basement under the test cells. Showers, cafeterias and some offices are centrally located on the mezzanine and do not conflict or congest operations in the working area. The two cafeterias, strategically and conveniently located east and west, comprise 15,834 sq. ft. and are equipped to serve the 3,322 employees of KK.

Filtered-Air

KK is provided with an air system comprised of several units mounted on the roof at strategic locations, so distributed and of sufficient capacity to completely filter, heat and recirculate all the air in the building in a little less than eleven minutes. The heat is supplied through a tunnel to these pent houses from the enlarged central heating plant. The building is provided with a fluorescent lighting system to

Factory's Highlights

- First production machines installed August, 1947. By mid-April, 1949, more than 1,000,000 horsepower of diesel engines manufactured and sold.
- Total floor area (under roof) 20.6 acres, with 10.6 acres machine shop area and 8.2 acres assembly area. Over an acre devoted to restaurant, lockers, washroom facilities.
- 4 miles of conveyors, 1,400 cranes ranging 500 lb. to 15 ton capacity.
- 21 test cells, each large enough to test two engines. Machine shop has 1,140 machines, assembly area 78 machines.

give 40 foot-candles of illumination at eye level. Power is distributed throughout the building to the machines by means of a tailor-made buss-duct system.

The diesel engine factory is the first major milestone in Caterpillar's post-war expansion program. Devoted exclusively to the manufacture of diesel engines to power the Company's diesel track-type and wheel-type tractors and diesel motor graders and to serve as well as stationary power units, the building permits integration of manufacturing processes and the expansion of facilities in older areas of the Peoria plant.

Snow Removal Notes

By John B. Church

Superintendent of Maintenance
Maine State Highway Commission

On the heavier travelled highways of Maine permanent winter crews are maintained in camps at strategic locations. These crews are equipped with state owned trucks, graders, and power shovels, and are responsible for both the plowing and ice control within their section.

Although actual snow removal work

requires the largest expenditure and the greatest amount of expensive equipment, ice control is the most serious and difficult problem in most sections of the state.

There are two methods in use at present. The first and common procedure is an application of salt treated sand. This material is stock piled at convenient locations. About 75 lb. of salt per cubic yard of sand is required to prevent the pile freezing and to aid in imbedding the sand and removing the packed snow or ice. On heavily traveled highways with numerous steep grades as much as 100 cu. yd. per mile is made available at the beginning of the season.

Privately owned trucks equipped with mechanical spreaders are located to cover sections varying from 5 to 10 miles depending on the volume of traffic. In areas of the heaviest traffic, power shovels or bucket loaders are used to load sand trucks which greatly speeds up this work.

The second method and one which is to considerable extent replacing the use of sand is the application of salt. This material is applied through special spreading devices to a width of about one foot along the center of the road. About 350 lb. per mile are required for a single application. The success of this method depends to a great extent on close plowing and the time of application. The snow must be removed as closely as possible to the road surface, and the salt must be applied immediately after the last passage of the plow. If 1½ in. or more of snow is left on the road, the salt treatment is comparatively ineffective. Also but little is accomplished by the use of salt if its application is delayed until the snow is solidly packed or the temperature falls below 20 degrees above zero.

It is a far cry back to the days in spring when motorists carried axes to chop a switching arrangement from one set of ice ruts to another when they met another car.

Some Solutions to Every Day Traffic and Parking Problems

(Continued from page 67)

dividers to separate opposing traffic flows, in addition to their channelizing function.

Alarmed by traffic tangles and increasing accidents, Peoria, Ill., began a program of street modernization several years ago which placed emphasis on the use of channelizing islands. To help in locating and designing the structures, small clay models were made in some cases and temporary installations were built of lumber. Temporary islands were left in place for about six months, then, with minor location or design changes, permanent islands were constructed.

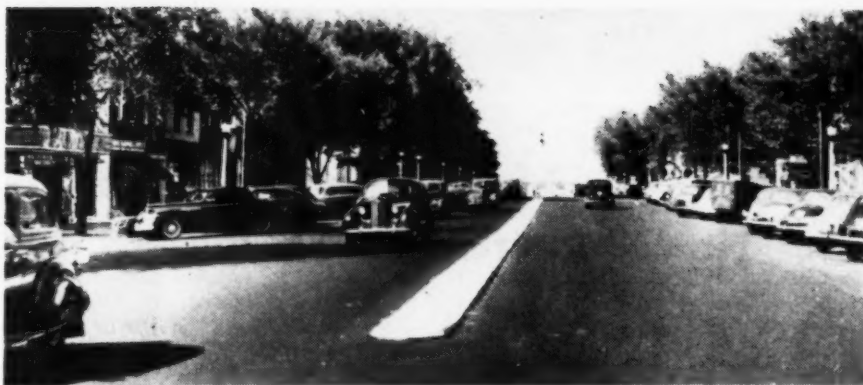
Following a street improvement program, one particularly bothersome location developed at the six-way intersection of Franklin, Harrison and Jefferson Streets, traveled by up to 28,000 vehicles per day. The first step in bringing order to the intersection was the installation of a three-phase traffic signal control system. But that was not the complete answer because of the large number of turning movements. Six concrete channelizing islands, painted "zebra" style, plus painted traffic lane lines solved what once appeared, to the layman at least, to be an almost impossible problem. Traffic now proceeds in an orderly, uncongested manner, and accidents have dropped to a minimum.

8. Transit Improvements

Public transit is called upon to handle a large bulk of the daily trips taken in our larger urban areas. Improved routing and scheduling would in many cases help substantially to overcome congested traffic conditions. Every effort should be made, where necessary, to provide additional and special services such as express to outlying districts, shuttle service to fringe parking lots and off-peak shoppers' services.

9. Off-Street Parking

The relief of traffic congestion and reduction of traffic accidents are in-



★ Median strip construction where street width permits is a safety step

timately related to the parking problem just as parking is an integral part of the whole highway transportation problem.

Curb parking must be progressively restricted, as traffic increases, to provide for moving motor vehicles. It is far more important to businessmen to have the shopping area easily accessible than to allow a few cars to park at the curb. Angle parking at the curb is particularly hazardous, since it means cars back out blindly into the traffic stream. Any type of curb parking adds to the serious urban pedestrian accident problem.

Every urban area needs an official program for studying and acting on the downtown parking problem. More than 300 small and medium sized cities now have free or low-cost municipal parking lots, and a number of highly successful merchant parking cooperatives now exist—notably the one in Oakland, California, where downtown parking is provided free by merchants, at a cost to the merchants of about five cents per car. The low cost is possible because parking is free for only one or two hours, so a rapid turnover of spaces is guaranteed. Allentown, Pa., merchants recently organized a similar program.

Zoning laws requiring those who erect new buildings to provide parking spaces in some ratio based on floor space or number of customers are being used effectively. Arlington, Va.,

has such zoning laws. This is the logical answer to the parking problem, because the problem is created by stores, theaters, office buildings and other structures which attract large numbers of persons. However, logical answers are not always practical answers and in some cities such zoning laws may not be expedient. And it takes time for zoning to become an effective cure for parking ills.

A special benefit-district tax, by which the city provides the parking space and assesses benefited property over a period of years to pay the cost, has been successful in some cities, notably Kalamazoo, Michigan and Kansas City, Kansas.

Still another method adopted in some cities, is the creation of a Parking Authority with broad powers to condemn land, build parking structures, levy a limited tax and operate or lease the parking facilities. Richmond, Va., and Madison, Wis., recently created such an agency.

Getting Together Pays

The correlated problems of traffic congestion and parking can be solved by strong coordinated action of city government, business and civic groups. This action must be founded on the solidity of fact-finding surveys and guided by a soundly conceived long-range plan that encompasses not only the needs of today but anticipates the needs of the next 10 or 20 years.



★ In Washington, D. C., "before and after" a widening project was completed, greatly increasing the safe street capacity



New Construction Equipment and Materials

600 Traffic Line Marker

Two models of a new design, controlled flow, paint striper for road and industrial use, have been announced by the Universal Marine and Mfg. Corp., 137 Alexander St., Yonkers 2, N. Y. The two models vary in paint capacity and minor design features. Both feature

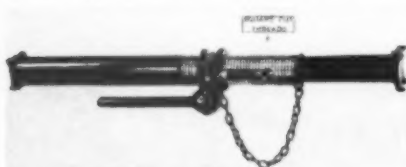


Gravity Feed Paint Striper

the brushless gravity feed, shoe-type paint spreader which works with any striping or zone paint of standard manufacture. The spreader is entirely of steel and rolls the paint evenly over the entire width of the stripe. Spreaders are furnished in widths of 2 to 8 in. and are interchangeable but not adjustable. A distributing apron receives the paint from the gravity line and feeds it evenly to the finger roller which spreads it on the pavement or floor.

601 Trench Jack; Steel Shore

A new adjustable steel trench jack, designed primarily for lateral strutting in trench excavations, has been announced by Acrow, Inc., 420 Lexington Ave., New York 17, N. Y. The adjustment feature



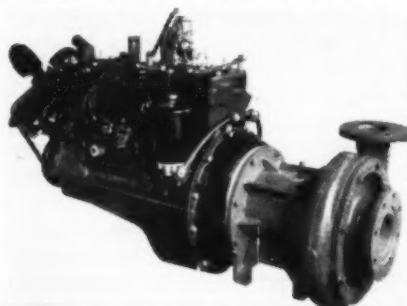
Acrow Trench Jack

of the jack—which is a screwing action—consists of a nut located over a square-cut thread, cut four threads to the inch, which activates a pin passed through the slot in the outer section, and through closely spaced holes in the inner section.

The jack is manufactured in three sizes which cover a range of adjustment from 1 ft. 6 in. to 5 ft. 6 in. and of prime importance is the safety feature which incorporates end plates especially designed to insure positive and safe fixture in trench walings. The jacks are placed in position by one man and have no loose parts. Operating on a principle similar to the jack in the Acrow adjustable steel shore, designed for supporting form-work or for spans greater than the 5 ft. 6 in. limit on the trench jack. A feature similar to the jack is that the shore may be placed in position in a matter of a few seconds. Manufactured in four sizes, the shore covers a range from 5 ft. 7 in. to 15 ft. The shore may be placed in position by one man and, having a 6 in. base plate, will stand independent of support.

602 Centrifugal Pump

A new single-stage side-suction pump developed by The Weinman Pump Manufacturing Co., 304 Spruce St., Columbus 8, Ohio, is claimed to be especially suited for city street maintenance purposes and for irrigation systems. This high-head, centrifugal type pump, can be close-coupled to a gasoline engine by means of a



Weinman single-stage centrifugal pump close-coupled to gasoline engine.

splined shaft and driving disc. It may be used with any suitable engine equipped with a standard SAE fly-wheel housing or may be adapted to special fly-wheels and fly-wheel housings. Made of standard gray iron casting, the pump is available in 2½ in., 3 in., and 4 in. sizes for capacities up to 1,000 GPM and heads up to 230 ft., 100 lb. pressure per square inch.

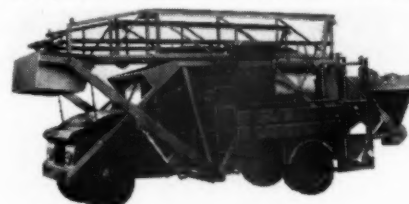
603 Rock Crusher

A new double impeller impact breaker designed for secondary crushing and small gravel installations has been added to the line of the New Holland Manufacturing Co., Mountville, Penn. The new Model 1212 will handle material passing a 12 in. square opening. It is designed to produce crushed aggregate as fine as 1 in. minus in a recirculating system. Weight of the model is 7900 lb. It has an inlet feed opening of 12½ in. x 12½ in. Outlet discharge opening is

15½ in. x 66½ in. Bearings are self-aligning heavy duty anti-friction type. Either flat belt or V-belt drive can be used. Individual drives can be rigged to each rotor assembly or a single wrap drive can be used with idler pulley. Each rotor assembly weighs 1,089 lb., including the three 200 lb. rolls. The diameter outside the rolls is 21½ in.

604 Concrete Mixing Plant

Introduction of the one-yard Mixermobile, Model M-6, has been announced by Mixermobile Manufacturers, Portland, Ore. The compact new model was designed to meet the needs of contrac-



Model M-6 Mixermobile

tors for a machine smaller than the two-yard Mixermobile. Model M-6, like its big predecessor, is a complete mobile concrete mixing and elevating plant. The one-yard Mixermobile has a hydraulically operated self-loading skip for receiving batched aggregates directly from dump trucks, portable batching plants, or front-end loaders. Although designed for 1 cu. yd. batches, the mixing drum allows for overage. The unit has a standard 35 ft. steel tower, with 10 ft. extensions available. From the mixing drum, the mixture is transferred by a dumping "spoon" into the elevating bucket, then hoisted and poured into the storage hopper. Power is furnished by the truck motor, an 8-cylinder Ford industrial engine. A take-off unit transmits the truck motor power for loading the drum, mixing and hoisting. The M-6 Mixermobile can be used with ready-mix. The new model has several important new features, including the hydraulic operation of the skip and a single suspension drum mounting. The drum is driven by enclosed gears. Folded for traveling, the one-yard Mixermobile is 24 ft. long and 12 feet high. It weighs 20,000 lb.; or 6,000 lb. less than the 2-yd. model. It passes within highway limitations anywhere in the United States and complies with the standard truck highway speeds.

605 Post Straightening Device

A new device brought out by Barber Poststratner Co., New Haven, Conn., is claimed to straighten bent parking meter, pedestal sign and metal fence posts at a cost of 6 cents per post. The device is portable and compact, weighing only 60 lb. The only tool required is a bolt wrench.

606

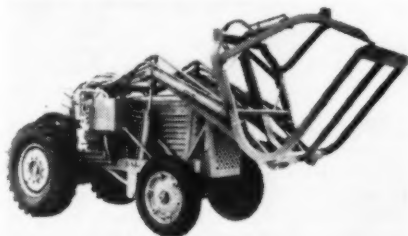
Bucket Controls for Paver

New bucket controls for the Multi-Foote paver have been announced by The Foote Co., Nunda, N. Y., subsidiary of Blaw-Knox Co. These controls are designed to be used with the bucket on the Multi Foote highlift boom and are mounted on the bucket itself. They permit the smooth operation of the bucket doors for any degree of opening, allowing the delivery of anything from a shovelfull to the full bucket load of concrete. It is stated that the man spotting the bucket can thereby deliver the desired amount of material with an accuracy that is impossible where control must be done from the paver deck.

607

Shovel loaders

Three new models, 4-AT, 4-BT, 4-CT, Shovel loaders, have been announced by the Lull Manufacturing Co., 3612 East 44th St., Minneapolis 6, Minn. The new series of Shovel loader models are



New Model Shovel loaders

equipped with a special fork attachment with a hydraulically controlled "hold-down" finger, lifting fork control cylinders, 3 valve sections, 3 conveniently located control levers and a rear ballast box. These new Shovel loaders are built and assembled complete at the factory. Other standard Shovel loader attachments can be used with the new unit by interchanging them with the lifting fork attachment. These attachments include material buckets, combination coal and snow buckets, cranes, bulldozers and independently powered sweepers.

608

Chain Tapes

A new chain tape announced by Lufkin Rule Co., Saginaw, Mich., is made of special tough, flexible, spring-tempered steel heavily chrome plated, producing a hard, smooth, non-glare chrome-white surface which will not chip, crack or



New Lufkin Super Hi-Way Drag Tape

peel and strongly resists corrosion, wear and tear. Its accuracy compares with that of other fine Lufkin steel tapes. The jet black lines and figures are deeply etched-in, making them stand out sharply, and easy to read at a glance in bright

or poor light. These Super Hi-Way tapes have one-half railroad gage mark, 2 ft. 4½ in. from zero—and clips of improved type are riveted to line, with reinforcing strip, which helps to avoid end-of-line breakage. They are supplied with two genuine leather thongs. Three types of graduations and numbering are available: "Regular," (C-9100 series) with blank space at each end, first and last foot subdivided to 10ths and 100ths, balance graduated every foot; style "A" (C-9100A series) with measurements beginning and ending at extreme outer ends of clips (rings), first and last foot subdivided to 10ths and 100ths, balance graduated every foot; and style "B" (C-9100B series) with blank space at each end, extra foot before zero subdivided to 10ths and 100ths numbered from right to left, balance graduated every foot, except last foot in 100ths. All Super Hi-Way tapes are available with "Regular," Type "A" or "B" graduations in either 100, 200 or 300 foot lengths and when specified are encased in a sturdy, metal reel, with large drum and long folding winding handle, hardwood carrying handle. Tapes over 100 ft., have 4-arm reel with "D" handle and spike end.

609

Concrete Vibrating Screed

A new gasoline-powered vibrating screed has been announced by the Stow Manufacturing Co., Binghamton, N. Y. The complete unit includes a 1½ h.p. Power-Pak, with built-in vibrator, mounted on heavy brackets, which are bolted to the beam. The engine base plate is mounted on four multiplane vibration



Stow Vibrating Screeds

dampeners to absorb screed vibration in both the vertical and horizontal planes. End roller supports are attached at each end of the beam by means of standard rubber vibration dampeners. Vertical adjustment is provided so that the beam may be elevated out of contact with the side forms. Four sizes are furnished, providing spans of 6, 8, 10, and 12 ft. All beams are 3 in. wide and have depths of 8, 10 and 12 in.

610

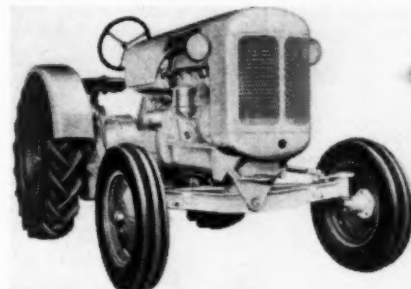
Body and Fender Hammer

A new Thor pneumatic body and fender hammer, announced by the Independent Pneumatic Tool Co., Aurora, Ill., is equipped complete with yokes and associated accessories for repairing all types of turret tops, hoods, bodies, doors and fenders. Outstanding features claimed for the new hammer include: Ball swivel action on both upper and lower dollies that always align perfectly; push button "On-Off" air control that works like an electric switch; independent needle valve, with knurled nut control that regulates speed and power of the hammer from dead stop to full power; sensitive ratchet control that guides hammer to exact clamping position; positive ratchet lock which is set or released by a flip of the finger and holds the hammer firmly locked in position and rigid yoke locking device which permits quick changes and prevents wear and loose-fitting yokes.

611

Tractor

A new 25 h.p. Centaur CI industrial tractor has been announced by Le Roi Co., Milwaukee, Wis. Featuring the Le Roi 25 h.p. D140 industrial valve-in-head engine, the CI power rating is claimed to be one of the highest for wheel type tractors in its class. The basic tractor



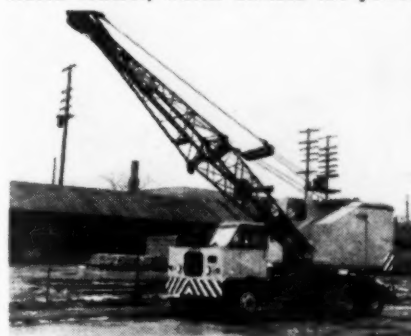
Le Roi Centaur Tractor

design comes from the Le Roi Centaur highway and airport mower and retains the low center of gravity and short turning radius. Full crown fenders with clearance for high lug snow or mud chains and extremely low center of gravity are safety features. A complete complement of attachments including loader, backfill blade, snow plows, rotary sweeper, utility boom, and winch, are available for construction and industrial yard applications. An all weather cab and lights permit outside winter operations such as snow plowing.

612

Truck Crane and Carrier

A new truck crane and carrier combination has been announced by the Northwest Engineering Co., 135 South La Salle St., Chicago, Ill. The crane has a capacity of 20 tons. The minimum boom length for crane work is 30 ft.—and this boom is extendible to 100 ft. length by addition of standard intermediate sections. Main operating machinery of the crane is mounted on cast steel side frames. All high-speed shafts are mounted on ball or roller bearings. The "Feather-Touch" clutch control, which utilizes the power



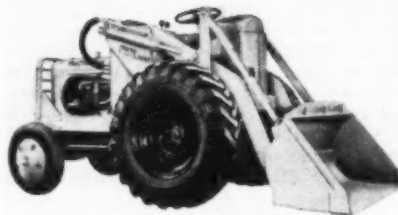
Northwest Truck Crane

of the engine to throw heavy drum clutches, uniform pressure swing clutches and a high-speed, power-controlled boom hoist, independent of all other operations, are standard equipment. The carrier has a box type truck frame that is reinforced the full length of the carrier. The method of attaching the crane lower base to the carrier permits the transmission of loads evenly over the top and sides of the carrier. Outriggers extend the full width of the carrier and have unusual bearing support when extended. The forward outrigger is positioned close to the rear wheels to relieve the carrier of a greater

amount of stress. The rear outrigger trunk is demountable and makes possible changing from crane work, with increased efficiency, to shovel, dragline or pullshovel work without the necessity of repositioning the lower base for the crane.

613 Front End Loader

A new materials handling loader has been placed in production by Tractomotive Corporation, Deerfield, Ill., the company that builds the Tracto-Shovel for the Allis-Chalmers Model HD-5 Track-Type Tractor. This new unit, called the TL-W Tracto-Loader, has a $\frac{1}{2}$ cu. yd. standard bucket. It is mounted on rubber tires and has the bucket over the driving wheels and the steering wheels in the rear. The TL-W's has an overall length of 12 ft. with bucket down,



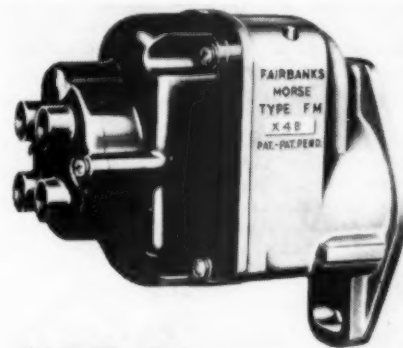
TL-W Tracto Loader

and a width of 5 ft. 9 in. (outside tire measurements). In operation the bucket is eased into the materials and picks up load through forward crowding action and an automatic "tilt-back" feature. The bucket is hydraulically operated and positively controlled. It can be dumped in part or all at once. Special service features that simplify maintenance of hydraulic system are one-piece, seam-

less steel tubings and hydraulic hose lines with detachable and re-usable fittings.

614 Magnetos for Road Machinery

An improved line of magnetos for road machinery has been announced by Fairbanks, Morse & Co., Chicago 5, Ill. The new magnetos are known as the "FM-X" line and includes 1, 2, 4 and 6-cylinder magnetos suitable for all types gasoline engines. Predominating features claimed for the new magnetos are longer life



Type X48 Magneto

breaker mechanism, larger bearings, improved magnetic rotor and improved timing facilities on the four-cylinder units. Included in the line is a 4-pole magneto, FM-XV4B7, which is used by Wisconsin Motor Corporation on their V-type engines. Along with this line of magnetos, Fairbanks, Morse & Co. have developed a new universal impulse coupling known as the type UE. By use of this all-purpose coupling and one extra coupling hub, it is claimed to be a simple matter to make literally hundreds of magneto specifications. As an illustration—by using the UE Impulse Coupling, NY2563-C, built with the U2563 hub, you make a coupling for adjusting to lag angles of 10°, 20°, 30°, 40° or 50°. The coupling also provides for the adjustment to various lug angles to meet changing operating conditions. Each hub has two keyways; for clockwise rotation use the keyway marked "R," and for counter-clockwise rotation use the keyway marked "L."

615 Shovels and Cranes

Three new rubber tired machines—the Types 34-T, 34-M and 604-M—have been announced by Lima Shovel and Crane Division of Lima-Hamilton Corporation, Lima, Ohio. The Type 34-T is mounted on a truck chassis with independent power (two engines—one in the rotating assembly, which powers all shovel and crane operations, and one in the truck, which is used for propelling the carrier). Standard equipment includes a 5-speed main transmission and 2-speed auxiliary transmission which facilitates 10 speeds forward and 2 reverse. The Type 34-M differs from the 34-T inasmuch as it is a self-propelled unit with one engine mounted in the rotating assembly supplying the power for all operations including propelling in either direction. Power for propelling is transmitted from the standard reversing clutches in the rotating assembly through a special train of gears and the vertical propeller shaft to the wheeled mounting. A two-speed transmission is standard. A four-speed transmission is available if desired. The Type 604-M rotating assembly

STATE HIGHWAYS Choose EAGLE LOADERS

- 3 TO 5 YDS. per minute
- ONE MAN operated
- JOB TO JOB at truck speeds

- Hard at work on the thousands of miles of state highways, these Eagle loaders are speeding up the handling of windrow dirt, loading from stock piles, snow removal (in season), etc. Eagles can load more—faster!



WRITE FOR DETAILED SPECIFICATIONS—DEPT. RS-69

EAGLE
JAW CRUSHERS • IMPACT BREAKERS
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CRUSHER CO., Inc. GALION OHIO-U-S-A



Type 604-M Equipped with 45 ft. Boom, Crane Rigged

incorporates the basic features of the Lima Type 604, but with alterations to facilitate adaption to truck mounting. Like the Type 34-M, one engine, mounted in the rotating assembly, supplies the power for all the operations including propelling in either direction. Rigid type outriggers are standard equipment. The carrier is equipped with oscillating tandem type rear axles which provide extra flexibility when working on uneven terrain.

616 16 H.P. Engine

A new 4-cylinder gasoline engine for a wide range of "Cub-horsepower" applications, the International U-1, has been announced by the Industrial Power Division of International Harvester Co., Chicago, Ill. Addition of the 16 h.p. U-1 expands the International line of carbureted engines to five, ranging up to 55



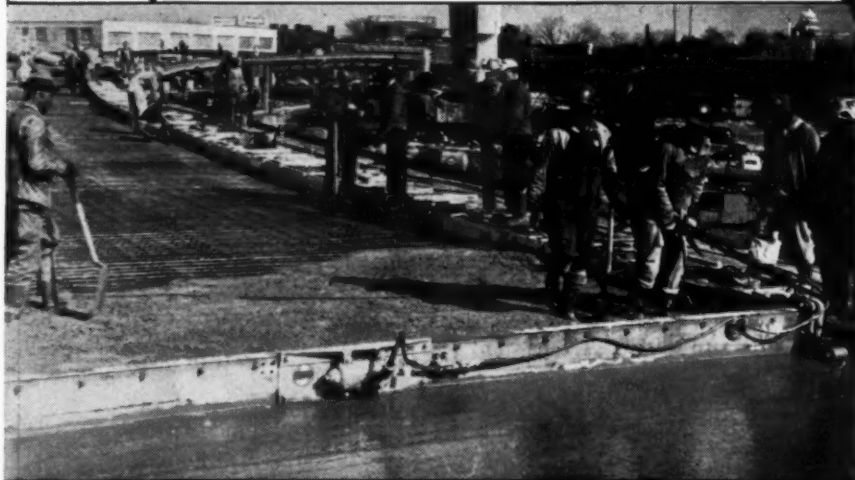
International U-1 Engine

rated horsepower. Stripped, the U-1 delivers a maximum of 16.3 brake horsepower at 2500 r.p.m. It develops a maximum of 16 working horsepower equipped with fan, radiator and air cleaner. Overall dimensions of the engine are: 26 13/32 in., length; 16 11/32 in., width; 25 in., height. The engine itself weighs approximately 280 lb.; the complete power unit, 450.

617 All-Purpose Hose

A new all purpose hose announced by the Mechanical Goods Division of Good-year Tire & Rubber Co., Akron, Ohio, is capable of carrying air, water, oil, gasoline and acids of low concentration and temperature. This hose is made with vertically braided rayon carcass and oil-resisting synthetic tube, friction and cover. It is being manufactured in sizes from 3/16 in. to 1 1/2 in. inside diameter.

FOR Bridge Decks Municipal Paving Highway Widening



THE JACKSON PAVING UNIT IS, BY LONG ODDS, YOUR BEST BET!

This outfit, which consists of an electric, vibratory, manually guided paving machine and portable power unit, will place perfectly upwards of 65 Cu. Yds. of stiff mix concrete per hour.

It will undercut at the side forms or curbs; strike off to crown (both regular or inverted); roll back for second passes.

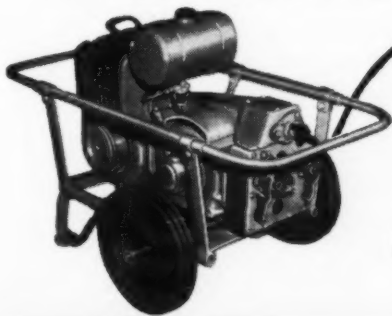
Thoroughly vibrates concrete in slab depths up to 10 inches and is quickly adaptable to any slab width from 6 feet up to any practical width.

Non-reciprocating, works right up to and around sewers, manholes and other obstructions. Has such strong tendency to propel itself forward that little effort is required. Operators work from front, rear or sides. For handling municipal paving jobs, bridge decks, highway patching and widening quickly and at a minimum of cost, there is nothing like it. Write, NOW, for complete facts.

FOR SALE OR RENT AT JACKSON DISTRIBUTORS

OTHER MONEY-MAKING PAVING EQUIPMENT

Jackson Vibratory Paving Tubes for vibrating full slab widths of highway and airport paving; Jackson Side Form Vibrators for attachment to standard finishers or spreaders to eliminate manual vibrating; Vibrators for every type of construction.



Model M-1 Power Plant, usually furnished with Paving Unit; 1.25 KVA, generates both single and 3-phase 60 cycle AC. Also suitable for lights and operating other vibrators and contractors' tools. Model M-2—2.5 KVA. Both are equipped with permanent-magnet generators requiring no adjustment or maintenance.

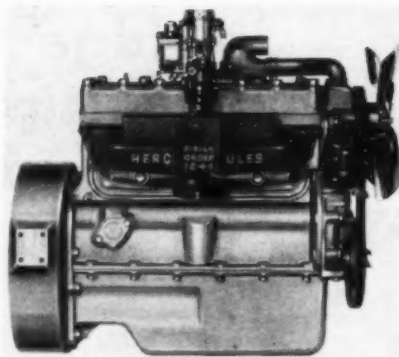
Manufactured by
ELECTRIC TAMPER & EQUIPMENT CO.

for

JACKSON VIBRATORS, INC., Ludington, Mich.

Gasoline Engines

Further expansion of its extensive line of 2, 4 and 6-cylinder high speed, heavy duty gasoline engines has been announced by the Hercules Motors Corporation, Canton, Ohio, with the addition of the "JX4" series of 4 cylinder models. These consist of: Model "JX4E," 3½ in. bore & 4¼ in. stroke, 164 cu. in. displacement. Model "JX4C," 3¾ in. bore x 4¼ in. stroke, 188 cu. in. displacement. Model "JX4D," 4 in. bore x 4¼ in. stroke, 214 cu. in. displacement. These new Hercules 4-cylinder gasoline engines are for general purpose power application. They parallel in design the popular "JX" series 6 cylinder engines. The "JX4" series is equipped with five main bearings and the crankshaft is counterbalanced



New Hercules "JX4" Engine

for double assurance of smooth, vibrationless operation, and to reduce bearing loads. The crankshaft is also Tocco

hardened to permit the use of bearing metals of relatively hard and long service qualities. A positive oil seal at front and rear of the crankshaft is further protection against oil escaping at these points. The main and connecting rod bearings are of the precision type. The main bearings are brass-backed, babbitt-lined. The connecting rod bearings are steel-backed, copper-lead lined and lead plated.

Off-The-Road Tire

A new tire, the Lugger Traction Tread, has been added to the heavy duty truck tire line of Cooper Tire & Rubber Co., Findlay, Ohio. Present production has been

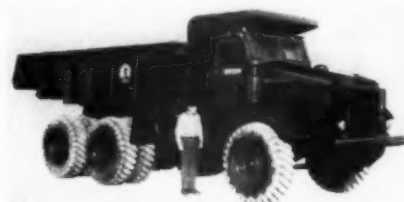


Lugger Traction Tread Tire

concentrated on sizes 8.25-20, 9.00-20 and 10.00-20 in 12 and 14 ply ratings. Plans for additional sizes are now being completed and will be announced at a later date. The development of a tire body having extra strength under the tread, plus extra reinforcement at the shoulders and sides to uniformly distribute and absorb impact and shock accounts for the unusual service delivered by this new off-the-road tire, Cooper engineers pointed out. Simplification has also been effected, according to officials, because the Lugger Traction Tread is adaptable to most off-the-road and on-the-road operations.

34 Ton Tandem Axle Euclid

The new model FFD Rear-Dump Euclid, announced by The Euclid Road Machinery Co., Cleveland 17, Ohio, is powered by two diesel engines—mounted side by side—of 190 h.p. each for a total of 380 h.p. Each of these engines drives



Model FFD Euclid

one of the rear axles through a torque converter and torqmatic transmission, thus eliminating the conventional inter-axle power divider. There is no clutch pedal or manual shifting of gears—the operator can change to the proper gear under full power at any travel speed. Top speed with full 68,000 lb. payload is 25.4 m.p.h. Total braking surface is 1620



Model Illustrated: Standard 3 cu. yd. contractors body with running boards, side braces and half-roll cab protector. Mounted over Marion model 721A hoist.

There's More Pay Load in "On The Job" Design

Extra pounds on every trip . . . faster loading and unloading . . . fewer lay-ups in the repair shop . . . longer service life under the toughest hauling conditions. These extra-profit features are built into every Marion unit by engineers who study special hauling problems right on the job. Ask your nearest Marion Distributor about a Marion Body and Hoist designed under the actual working conditions you face. Or write direct.



MARION
DUMP BODIES and
HYDRAULIC HOISTS

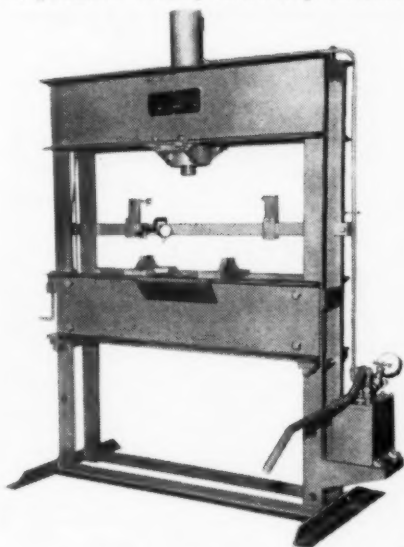
GET MORE DETAILS NOW
Just mail a post card or letter for the complete Marion catalog, or ask your Marion Distributor.

MARION METAL PRODUCTS CO., MARION, OHIO

sq. in. The two planetary drive axles—with reductions at each wheel—are mounted on free floating springs. Payload capacity is 20 cu. yd. struck and 34 short tons.

621 Shop Press

A new version of the Rodgers "60"—60 Ton shop press—in 60 and 80 ton capacities had been announced by Rodgers Hydraulic, Inc., Minneapolis, Minn. Standard shop presses are now available in 60 to 400 tons. Features include a full 13 in. pressure stroke, accurately matched



60 and 80 Ton Shop Press

and machined V-blocks, lower bolsters supported by bearing blocks—on steel support pins, fast arbor press action eliminating need for separate arbor press, and operation by either hand or power pumps. A new, improved 2-speed hydraulic hand pump with automatic shift permits fast ram speed—1½ in. per stroke with 2 ton high speed pressure on the "60" and ¾ in. travel with 3 tons on the "80." When the maximum 2 or 3 ton pressure has been reached the pump shifts automatically into high pressure. Presses may be equipped with power driven pumps for faster speed.

622 Motor Grader

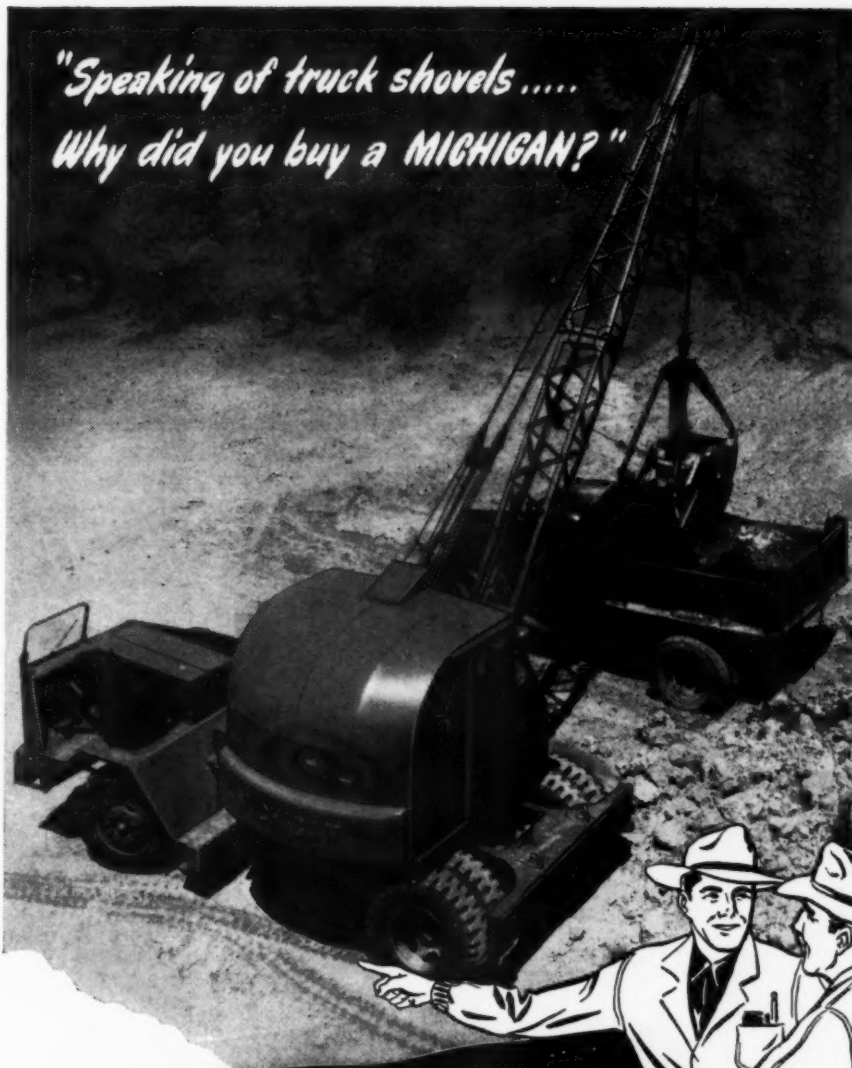
A new Warco 4D-100 extra heavy duty motor grader has been announced by W. A. Riddell Corporation, Bucyrus, Ohio. This new grader is the first built by Riddell in the 100 H.P. class. This 4D-100 motor grader has been thoroughly tested under demanding conditions by a leading state highway commission, the company reported. Ditching, back filling,



Warco 4D-100 Motor Grader

bank sloping, scarifying, applying black top, and fine grading were typical assignments. Outstanding "on the job" advantages claimed for the new Warco include: full 360° revolving of the circle without removing the scarifier or teeth; less operator fatigue because of easy hydraulic control; unusual blade reach;

*"Speaking of truck shovels
Why did you buy a MICHIGAN?"*



"Because it Moves Dirt FAST!"

It's yardage that counts! And my MICHIGAN has convinced me that you don't always need a big dipper to get big yardage. No matter what I put her on—sand, gravel, clay, rock—that baby really goes to town! Gets out more yardage per hour than any shovel that size I've ever owned. She crowds and swings fast, and dumps fast and clean. When anyone says truck shovels to me, I say, 'my next one's a MICHIGAN, too!' For the best 'buy' in a truck shovel, get a MICHIGAN!"

Write for Bulletin 100—
"On the Job With MICHIGAN"

MICHIGAN

MICHIGAN POWER SHOVEL COMPANY
480 SECOND STREET BENTON HARBOR, MICHIGAN

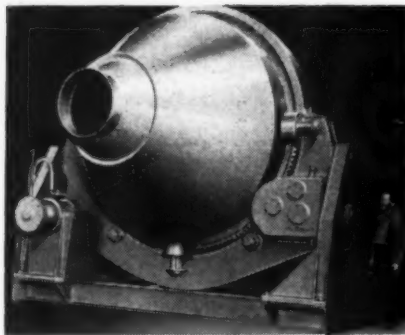
DID YOU KNOW
you can buy
a brand new
MICHIGAN
TRUCK CRANE
complete with
chassis for as
little as \$10,250
F.O.B. factory?

and exceptional clearances under the front axle and transmission. The new model is the latest in a series of hydraulically controlled graders, the first of which was built in 1926 and was just recently retired from service.

623

6-Yd. Concrete Mixer

To meet the demands of ready-mix plants and big construction projects, The T. L. Smith Co. of Milwaukee, Wis., has designed and built a new 6 yd. tilter which is said to be the world's largest concrete mixer. Although the machine has low weight, as well as low overall height and length, it is said to be of unusually sturdy construction. Features include: Automatic feed chute charging,



Smith 6 yd. Mixer

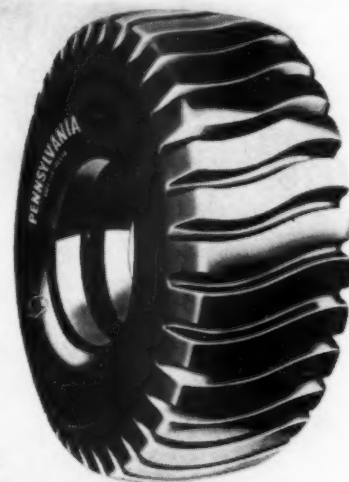
"Tilt and Pour" discharge without segregation, complete control of discharge,

all-welded support pedestals and tilting frame, 100 hp. electric motor direct connected to transmission by a splined shaft double universal joint, and push button or manual controls. One of these new Smith 6 yd. tilters was sold and shipped to a large New Jersey ready-mix plant. Another unit will soon be operating in New Mexico.

624

Truck Tire

A new off-the-road truck tire, the Rock Lug Logger, has been announced by the Pennsylvania Rubber Co., Jeannette, Pa.



Rock Lug Logger

Designed for all off-the-road operations such as construction work, strip mining, quarrying, and logging, this new self-cleaning tire has heavy, chip-proof, S-curved lugs for maximum traction. The Rock Lug Logger is available in all popular sizes for off-the-road vehicles.

625

Surge-Control Device for Trailers

A new self-contained, hydraulically-operated surge-control device, designed for use with 11, 12 and 14 in. mechanical brakes on all types of two and four-wheel trailers having capacities up to 5



A Sectional Type Plant . . . With Stationary Plant Efficiency



THE MOTO-PAVER

A self-contained, self-propelled machine which accomplishes the complete mixing and laying job in one continuous operation, using gravel, stone or slag aggregates and most types of emulsions, asphalts and tars. Particularly adapted for resurfacing jobs on county roads and city streets.

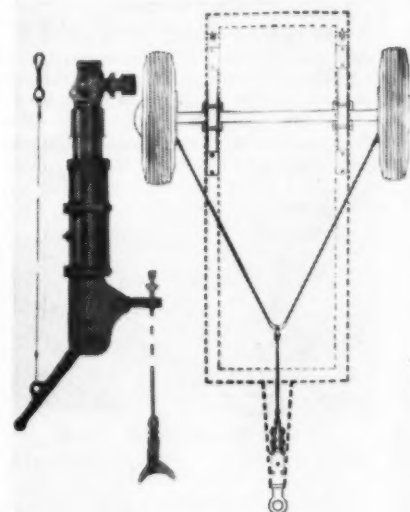
Although the Hetherington & Berner Model PE is a sectional type plant and can therefore be moved, it retains all the features of a stationary plant that make for dependable and efficient production.

PE plants are electrically driven. All motors and controls are furnished and installed, and the plants are completely wired at the factory before shipment. Optional with this type of plant is equipment for steam dispersion, fugitive dust collection, low pressure oil burning and dust handling. Write for Bulletin P-46 which gives specifications and complete information.

HETHERINGTON & BERNER INC.

721 Kentucky Ave., Indianapolis 7, Ind.

H&B Builds Portable and Stationary Asphalt Plants of All Types, Sizes and Capacities



"Titanic" Surge Control Device

tons, has been announced by the United Manufacturing Co., 51 Interstate St., Bedford, Ohio. It is stated that when

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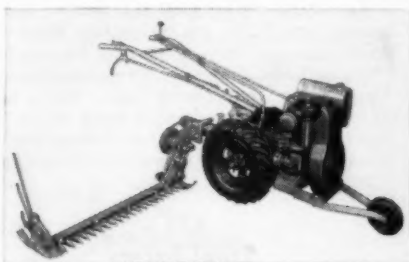
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, 1949

the towing vehicle slows or stops, a hydraulic cylinder in this new unit simultaneously and automatically applies an equal braking action to the trailer to bring it to a smooth, positive stop, and at the same time eliminates the jolting "over-ride" action. A complete unit consists of the hitch, hydraulic cylinder and mounting bolts, manual brake for parking, breakaway safety cable with snap connector, and brake equalizer and cable. This new device requires no special attachments on the towing vehicle. The 1½ in. travel of the hydraulic ram automatically applies braking power when needed.

626 Mower

A new mower manufactured by the Arians Co., Brillion, Wis., is claimed to operate in any position from vertical to vertical regardless of terrain, and to reach many places heretofore inaccessible with a mower. It attaches to an Arien Tiller that gives it plenty of power to do the job properly. It is stated it will cut anything from the finest lawn to the

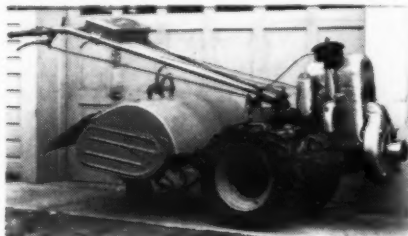


Arians All Purpose Mower

largest, toughest grass and weeds; cutting height 1 in. 1¼ or 2½ in. by simple adjustment. The cutting bar is 42 in. wide. By reversing the mower hinge assembly to the left the cutting width is reduced to 28 in. from right wheel—for fence row and other narrow mowing. Equipped with steel forged guards with integral ledger plates, the cutting bar is made up of 2 in. sections, there are no plates to change. Synchronization of blade travel with the forged steel guard is fixed in manufacture, and automatically maintained in all positions.

627 Rotary Tiller

The illustration shows a rotary tiller, applicable to soil preparation for roads and airport runways, made in Switzerland and introduced recently in the United States. This Grunder-Swisstiller has a one-cylinder, two-cycle engine of the manufacturer's own design. Horsepower rating is 8 h.p., engine speed is



Grunder-Swisstiller

2800 r.p.m. Cooling is effected by means of a turboblower located at the front end of the machine. The flywheel houses the magneto, which is accessible for adjustment without removing the flywheel.

Either gasoline or kerosene can be used as fuel. The transmission is incorporated, providing for three speeds forward and one reverse. One of the novel features is the provision for two speeds on the tiller. This permits working the ground to any desired combination as, for instance, finely crumbled ground on the surface and loose soil beneath. A simple single wheel declutching has been incorporated, which facilitates making turns. All of the controls are located at the handlebars. The handlebars can be raised and lowered easily and quickly, or moved sidewise to allow the operator to walk aside of the machine while operating. There are various attachments available, such as: sickle bar, front mowing attachment, plow, power takeoff, etc. General distribution of the tiller is handled by Lee Hydraulic Co., Troy, N. Y.

MANUFACTURERS' LITERATURE

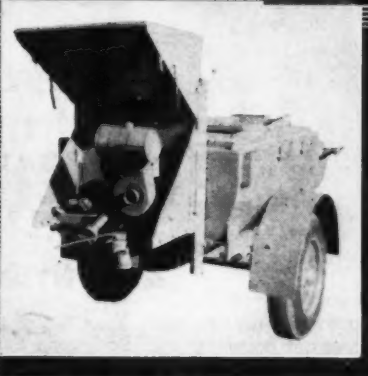
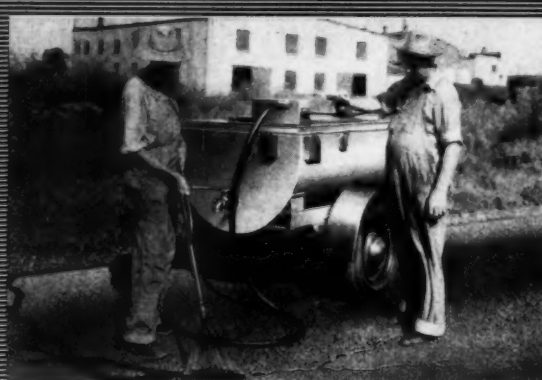
628 Shop Presses

A new 18-page catalog issued by Rodgers Hydraulic, Inc., Minneapolis, Minn., includes illustrations, construction and operation features and specifications on the complete line of Rodgers standard and special shop presses from 60 to 400 tons. It also includes descriptions of hand and power pumps and press accessories.

Patch

ROADS THE LOW COST WAY

Temperature
Easily
Controlled
•
Easy to Transport
•
Saves Money
on Patchwork



STANDARD STEEL TAR-KETTLES

PATCH AND MOVE ON IN
MINUTES AND SECONDS

With this Standard Steel Model "S" Kettle, "cold spots" or "burnt materials" are eliminated. You get uniformity of heat throughout the entire mass of material. Steady temperature at the correct level is maintained all day long. Easily transported—equipped with special safety features—it's a fast worker. With a motor spray attachment, it is even more efficient for road maintenance. Standard Steel also offers a complete line of crack filling pots, shoulder rollers and other road maintenance equipment.

WRITE FOR CATALOG AND PRICES

OTHER PRODUCTS OF STANDARD STEEL

Asphalt Pressure Distributors,
Maintenance Distributors, Patch
Rollers, Supply Tanks, Tool
Heaters, Asphalt Tools, Street
Flushers, Construction Brooms.



Standard Steel Works NORTH WANSAN CITY, MO.

At All Temperatures and Altitudes...

WISCONSIN
HEAVY-DUTY
Air-Cooled
ENGINES...



"Keep 'em Rolling"...

Whether handling highway maintenance and patching jobs in the valleys or at high altitudes in rugged El Paso County, Colorado, this Wisconsin-powered Galion Road Roller keeps on rolling along... delivering heavy-duty dependability and all the horsepower the job requires.

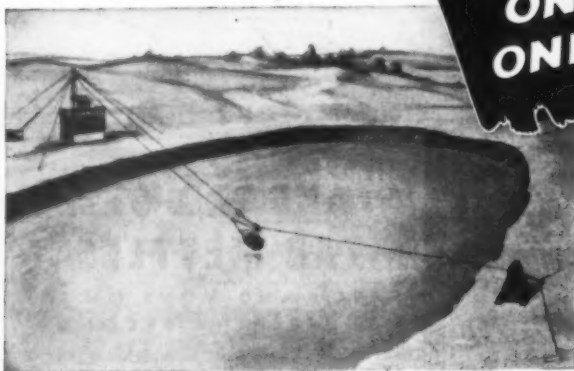
Because the Wisconsin Engine torque curve peaks at relatively low r.p.m. you have plenty of "give and take" power margin for the hard pulls without danger of stalling. And tapered roller bearings at BOTH ends of the drop-forged "he" crankshaft take up thrust loads, providing fullest protection against bearing failure. Extremely efficient flywheel-fan AIR-COOLING and weather-sealed rotary type high tension outside magneto, with impulse coupling, assure smooth running, easy starting and trouble-free service anywhere, any time, at any temperature from sub-zero to 140° F.

4-cycle single cylinder, 2- and 4-cylinder models, 2 to 30 hp. Specify "Wisconsin Power" for dependability.



WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN



**ONE MAN ---
ONE MACHINE**

**Cheapest
Way
TO DIG
& CONVEY**

Above picture shows a typical setup of a Sauerman Slackline Cableway handling a deep sand and gravel excavation. Operated by one man, the cableway bucket scoops a heaping load of material from under water, lifts and conveys the load at a speed of 600 f.p.m. and dumps into a hopper on top of the aggregate plant, then returns by gravity to the digging point. Swinging in a wide arc, the machine is able to move a huge yardage at one setup of the mast.

● Manpower conservation—important for profitable production—is a major economy with Sauerman Slackline Cableways.

One, easily trained man handles the entire operation of digging, conveying, elevating and dumping.

Sauerman Slackline Cableways are designed for digging deep in any kind of ground—wet or dry—loose or hard-packed—for dredging material from pits, ponds or rivers and lifting to a high delivery point. Power consumption, either gasoline, electricity or Diesel, small on basis of tonnage handled. Upkeep simple—initial cost low.

WRITE TODAY
FOR CATALOG

SAUERMAN BROS., INC.
588 S. Clinton St. Chicago 7, Illinois

629

Hydraulic Control Hose

A new catalog section on its line of hydraulic control hose now available from The B. F. Goodrich Co., Akron, Ohio, lists many of the recommended uses for this type hose, made with special wire braid to give greater toughness and flexibility. The hose is made for working pressures ranging from 300 to 5000 lb. per square inch, depending on size and construction. A method of calculating correct bending radii for various hose sizes and illustrations of re-attachable couplings are among other features of the section.

630

Earthmoving

A new 16-page booklet (Form 12108) issued by Caterpillar Tractor Co., Peoria 8, Ill., is illustrated with applications and job studies of "Caterpillar" bulldozers, scrapers, wagons, motor graders and allied equipment. It contains performance data relative to levee construction, railway maintenance, back filling, land clearing, foundation work, highway and dam construction, stripping and quarry work, proven methods of irrigation ditching, snow removal and oil mixing for surfacing roadbeds. The various adaptations of Caterpillar equipment to this field through intensive development of a packaged fleet of earthmoving tools offers an overall view of the company's specialized products.

631

Steel Forms

A new 6-page bulletin on steel forms for concrete highways and airports announced by The Heltzel Steel Form and Iron Co., Warren, Ohio, thoroughly covers exclusive features of the standard Heltzel highway form and also details such special forms as the dual duty airport form, integral curb forms, extension forms, safety zone forms, stake pullers and miscellaneous accessory equipment.

632

Dual Fuel Diesels

Features of the dual fuel diesel engines of the Superior Engine Division, The National Supply Co., Springfield, Ohio, for gas or fuel oil operation, are given in an 8-page bulletin. Three naturally aspirated models with power ratings of 175 h.p. to 960 h.p. and two turbo-supercharged models with ratings of 505 h.p. to 1440 h.p. are covered. The bulletin describes diesel operation with the two fuels and illustrates the simplicity of controls with fuel conversion by either push buttons or hand lever.

633

Tractor Shovel

A new piece of literature, featuring the new Hough Model HM Payloader tractor shovel, is available from The Frank G. Hough Co., 871 Sunnyside Ave., Libertyville, Ill. Numerous action views show some of its digging, loading, grading and carrying uses. The positive action for the four-wheel pneumatic tire traction under severe job conditions such as sand, mud and rough terrain is graphically pictured. One-and-one-half cu. yd. bucket capacity and other specifications are shown as well as the many design details that are featured in this new 76 h.p. tractor shovel.

634

Gas Welding Supplies

A new 16-page catalog on gas welding supplies has been announced by Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y., manufacturers of oxyacetylene and air welding equipment. The new catalog, the first of a projected series of ten, completely describes 19 different gas welding rods, 8 different fluxes, and includes a section on silver brazing alloys plus a page devoted to carbon rods and carbon plates. The text material offers descriptions of the mechanical properties of the various products and recommendations regarding their application. Data on lengths, packaging and available diameters are included for each welding rod.

635

Steel Street Forms

A new 28-page booklet issued by Blaw-Knox Division of Blaw-Knox Co., P. O. Box No. 2, Blawnox, Pa., is designed to take the mystery out of the problem of selecting and using the proper paving forms for the construction of any type of concrete curb, curb and gutter, integral curb, special curb, or sidewalk. Altogether, 16 types of forms, embodying a completely standardized and inter-related steel form system, are described and illustrated. An illustrated guide also shows how to set and strip the forms in actual use.

636

Traffic Signs

Traffic signs reflectorized over the entire face of the sign with "Scotchlite" reflective sheeting are pictured and itemized in a new 16-page catalog offered in May by Minnesota Mining & Manufacturing Co., St. Paul, Minn. The reflective sheeting, applied to the face of the metal signs, enables them to reflect at night their true daytime shape, color and legend, the catalog points out. Life expectancy of the reflective sheeting is stated to average seven years.

637

Power Wheelbarrow

The Moto-Bug, a new power wheelbarrow, is featured in a new catalog issued by Kwik-Mix Co., Port Washington, Wis., a subsidiary of Koehring Co., Milwaukee. Actual photographs illustrating various Moto-Bug attachments and its many applications in construction and industrial work are spotted through the catalog. Schematic diagrams and engineering specifications are listed in addition for a concise summary of Moto-Bug design and performance.

638

Locomotive Crane

A new catalog covering its 30-ton diesel locomotive crane, issued by American Hoist & Derrick Co., St. Paul 1, Minn., contains illustrations of the crane in different types of work. Many mechanical illustrations are also included.

639

Preformed Wire Rope

A new folder has been released by Macwhyte Co., Kenosha, Wis., giving questions and answers on preformed wire rope, stating questions normally asked about this product and giving the answers.

DOES IT
WITH A
ROGERS

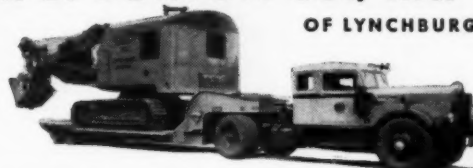
DOES IT
WITH A
ROGERS

ECK MILLEROF OWENSBORO,
KENTUCKY

using a Rogers Model D-35-D and a Rogers Pole Type Trailer loaded with 80,000 lbs. of steel tank 67 feet in length. The conventional trailer mounts a fifth-wheel type of bolster which supports the front of the load and tows the pole trailer which carries the rear of the load.

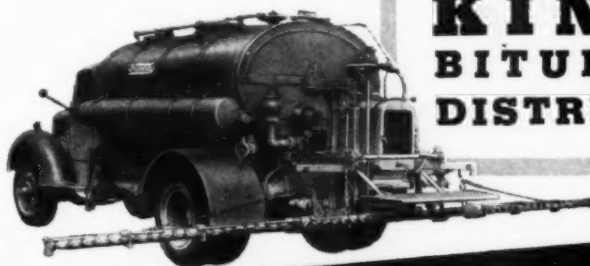
A. B. BURTON CO., Inc.

OF LYNCHBURG, VA.



Moving this heavy Northwest power shovel from job to job presents no problem to the A. B. Burton Co. when they have their D-50-D Rogers semi-trailer to rely upon.

and YOU CAN DO IT WITH A ROGERS trailer, whether the jobs involved require the hauling of light, medium or heavy equipment. Why not learn in detail just what Rogers has to offer? Write TODAY for your copy of the NEW CATALOG.

**ROGERS BROTHERS CORPORATION**DESIGNERS and BUILDERS of HEAVY DUTY TRAILERS
SINCE 1915110 Orchard St., Albion, Penna.
Export Office: 50 Church Street, New York 7, N.Y.
Cable Address: "Broscoites"**KINNEY
BITUMINOUS
DISTRIBUTORS**

HEALTHY CIRCULATION AT ALL TIMES



Kinney Bituminous Distributors are engineered to provide dependable bitumen circulation for top performance on every road building job. The jacketed Rotating Plunger Pump, coupled directly to the underside of the tank has large passages, unrestricted by valves or springs, and is heated by hot engine exhaust. This plus the inside circulating line, circulating spray bars, and the special "Kero-Circ" solvent flushing system keep Kinney Distributors in tip-top condition—ready for instant starting and accurate application. Kinney welcomes the opportunity to quote on your requirements. Write for Bulletin A-48.

KINNEY MANUFACTURING COMPANY

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New York • Chicago • Cleveland • Philadelphia • Los Angeles • San Francisco

We also manufacture Vacuum Pumps, Liquid Pumps and Clutches

SISALKRAFT CURING BLANKETS

Designed
BY ROADBUILDERS

Developed
BY ROADBUILDERS

Proven
BY ROADBUILDERS



*More than a half-mile of steel-like reinforcement per square yard.

THE SISALKRAFT METHOD OF CURING CONCRETE IS "MADE-TO-ORDER" FOR YOU

The SISALKRAFT Method of curing concrete roads actually cuts curing costs as much as 50% . . . saves you time, labor and money. With reasonable care under normal job conditions, you can get 15 uses or more from genuine SISALKRAFT Curing Blankets. Use them this year and see for yourself!

WRITE FOR THIS NEW 26-PAGE ROAD BOOK



*It contains
data you
will value*



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Please send the SISALKRAFT ROAD BOOK to:

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CITY, ZONE and STATE

THE SISALKRAFT CO.

Chicago 6 • New York 17 • San Francisco 5

640 Water Hose

A new catalog section on its lines of water hose used in a wide variety of services in industry, construction and mining is now available from The B. F. Goodrich Co., Akron, Ohio. The section pictures and describes construction of each type water hose the company manufactures, lists recommended uses and gives detailed specifications and coupling information.

641 Concrete Mixer

Important improvements in the design of the new Kwik-Mix 3½-S Non-Tilt Dandie concrete mixer are described in a 4-page bulletin published by the Kwik-Mix Co., Port Washington, Wisc., a Koehring Co. subsidiary. Included in the new bulletin is a description of the "V" belt theory as applied to mixing drum rotation.

642 Aggregate Feeding

Feeds and Feeding, a new illustrated booklet published by Pioneer Engineering Work, Inc., 1515 Central Ave., Minneapolis, Minn., discusses recommended practices for the systematic feeding of aggregates in crushing and screening operations. The text is in three parts: Feeding of Coarse Materials, Feeding of Graded Materials and Feeding of Mixed Materials.

643 Suction Hose

A new 4-page catalog section on its water suction hose, published by The B. F. Goodrich Co., Akron, Ohio, pictures and describes each of the hose brands in the company's line, gives specifications on each and lists recommended uses and conditions. Information on fittings used with the hose also are given.

WITH THE MANUFACTURERS & DISTRIBUTORS

F. H. Boor Enters Private Practice

F. H. Boor, for over 23 years chief Engineer of Fairfield Manufacturing Co., a gear manufacturer in Lafayette, Ind., has resigned from that company in order to devote his full attention to the technological study of gears, their designs and applications. A graduate of the Mechanical Engineering School of Purdue University and a registered, professional engineer, Mr. Boor has had broad experience in the design, manufacture and application of a wide variety of gears including spur, helical, straight bevel, spiral bevel, hypoid, zerol, worm, and differential gearing for automotive, aircraft, machine tool, construction and farm equipment, marine, and miscellaneous applications. Mr. Boor's services are available for technological study of gear designs, and he may be reached at 927 Highland Ave., Lafayette, Ind.

NEW! NEW! NEW!

5th Edition

A.A.S.H.O. Standard Specifications for Highway Bridges

This 1949 Edition is just off the press. Made up in Four Main Divisions with 72 subordinate sections, all details of general Provisions, Construction, Design and Materials are covered. Four Appendices carry tables of moments and shears, steel column formulas and graphs, a chart of truck, train and equivalent loadings and a diagram of permissible unit stresses for rectangular concrete columns.

284 pages, 6" x 9" cloth bound

\$3.00 postpaid

Order Direct from

American Association of
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1220 National Press Building
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Superior Quality

BLADES

AND CUTTING EDGES

For any make of machine
Motor Graders, Motor
Graders, Scrapers, Drag-
dozers, Backhoes, Trail
Wagon Scrapers, Trail
Blades, Trail Blasters,
Carryalls, Also—

CUTTING EDGES
WEARING BOOTS
BACK SLOPERS
EXTENSION BLADES
MOLDBOARDS
and
SCARIFIER TEETH

30 years of manufacturing
experience has developed
for you a special steel,
milled through our own
rolls and forged at the
edges to give that extra
wearing quality you need.

All widths, lengths, and
thicknesses. **STOCKED**
ready to fit your machine.

Consult your international-
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cialists. Write for special
bulletins, giving type and
name of machines you
operate—get set for Blades
early.



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Established 1854
BUCYRUS, OHIO

VULCAN PAVEMENT AND CLAY DIGGING TOOLS

ARE MADE in a complete line of sizes to fit all standard compressed air hammers.

Send for NEW Vulcan illustrated CATALOG today



TOOLS — THE WORLD OVER —
NOTED FOR QUALITY AND DURABILITY

VULCAN TOOL MFG. CO.
QUINCY, MASS.

New Hydrocrane Distributor

Porter Supply Co., Inc., Huntington, W. Va., has been appointed distributor for Bucyrus-Erie hydrocrane by Bucyrus-Erie Co., South Milwaukee, Wis. They will sell and service this all-hydraulic, truck crane throughout the southern half of West Virginia. Porter's territory includes the following counties and all of the state of West Virginia to the south of them: Jackson, Roane, Calhoun, Braxton, Webster and Pocahontas. In handling the hydrocrane, Porter will continue the policy it has maintained in distributing the $\frac{3}{4}$ to 2 $\frac{1}{2}$ -yd. line of Bucyrus-Erie shovels, cranes and draglines.

Le Roi Personnel Changes

Recent personnel changes in the sales department have been announced by Le Roi Co., of Milwaukee, Wis. Thomas V. Shea has been named general sales manager, J. E. Heuser, industrial engine sales manager, E. F. H. Dutton, Eastern district manager, and Clyde R. Schuler, sales engineer for industrial engines. Tom Shea's experience was three years Eastern district manager for Le Roi and several years with other construction equipment manufacturers. He succeeds J. M. Dolan, who is now vice-president and general sales manager of the Hydraulic Press & Equipment Manufacturing Co., Mt. Gilead, O. J. E. Heuser, for many years, worked in original equipment manufacturer and distributor sales. Formerly representing Le Roi Co. in the foreign sales department, "Dick" Dutton replaces Mr. Shea as Eastern district manager. Clyde R. Schuler comes to Le Roi Co. after 20 years with the Hercules Motor Co., Canton, O.

PORTABLE ASPHALT PLANTS

High Production—Low Cost



THE McCARTER IRON WORKS, INC.
NORRISTOWN, PENNA.

Named General Sales Manager

Raymond S. Perry, formerly president of the Eicor Corporation, Chicago, and previously in charge of sales and engineering of several of the country's large industrial organizations, has been appointed general sales manager of Federal Telephone and Radio Corporation, Clifton, N. J., Mr. Perry, a graduate of the Massachusetts Institute of Technology, will direct all the commercial activities of Federal, American manufacturing associate of the International Telephone and Telegraph Corporation.



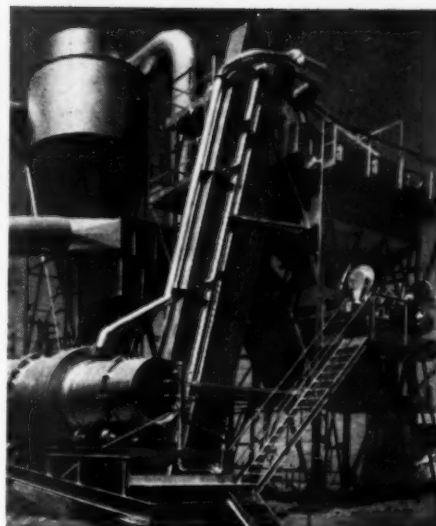
R. S. Perry

Hepburn Appointed Assistant Manager

Frank I. Kemp, Manager, Vertical Turbine Pump Division, Worthington Pump and Machinery Corporation, Harrison, N. J., has announced the recent appointment of James W. Hepburn as assistant manager of that division. Mr. Hepburn will make his headquarters at the Corporation's Denver Works where he will be responsible for customer relations in the sale of vertical turbine pumps in the territories west of the Mississippi River.

Appointed Sales Engineers

J. G. Wiegand and R. R. McKiel have been appointed sales engineers specializing in the sale of International Harvester industrial power products to manufacturers.



AMERICA'S FINEST PAVING PLANT

STANDARD is one of the oldest and largest builders of paving plants—seven sizes to meet all conditions. Used throughout the world. Modern, Unit-built, easy to erect and transport. Immediate delivery.

Write for Catalog

STANDARD STEEL CORPORATION

5003 Boyle Avenue

LOS ANGELES - - - CALIFORNIA

ELECTRIC WHEELS

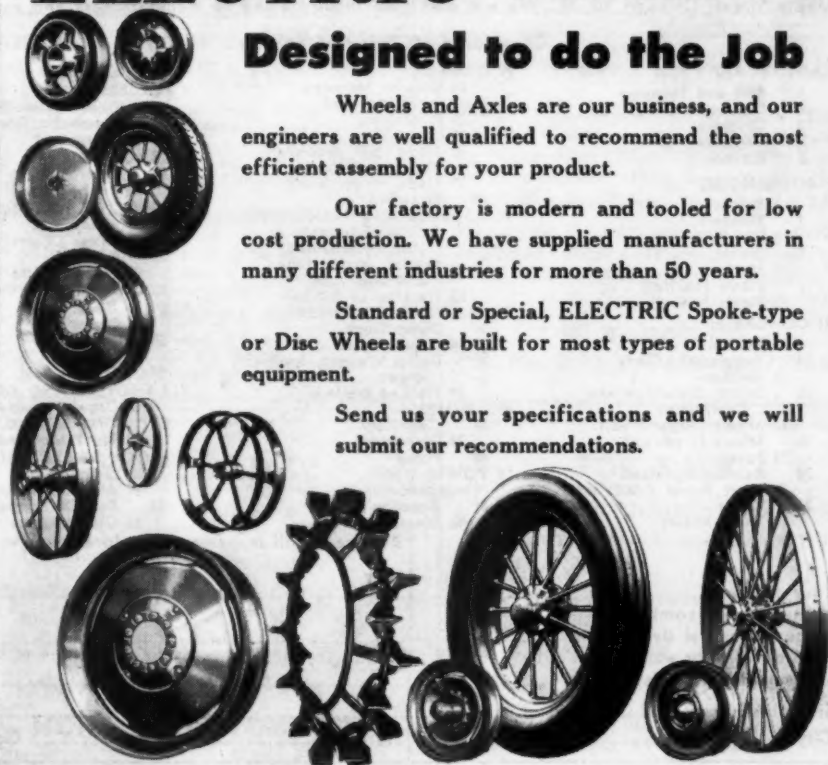
Designed to do the Job

Wheels and Axles are our business, and our engineers are well qualified to recommend the most efficient assembly for your product.

Our factory is modern and tooled for low cost production. We have supplied manufacturers in many different industries for more than 50 years.

Standard or Special, ELECTRIC Spoke-type or Disc Wheels are built for most types of portable equipment.

Send us your specifications and we will submit our recommendations.



Caterpillar Personnel Changes

Realignment and expansion of the General Sales Department and the expansion of the Advertising Department have been announced by Gail E. Spain, vice-president Caterpillar Tractor Co., Peoria, Ill. In the new sales structure H. H. Howard, general sales manager, assumes the title of director of sales with J. J. Valentine and J. H. Mohler named as assistant directors. Valentine, heretofore assistant general sales manager, will have administration of Eastern, Central, Western and Governmental Sales Divisions. Mohler, formerly manager of Sales Training Division, will now administer Sales Development Division and Sales Training Division along with two newly created divisions, Sales Engineering and Market Research. W. N. Foster, assistant Eastern Division sales manager, becomes manager of the new Sales Engineering Division while L. J. Deyo, former assistant to J. J. Valentine, heads up the Market Research group. K. F. Ames will succeed Mohler as Sales Training Division manager and will be succeeded as assistant manager of Central Sales Division by J. M. Abbey, formerly a district representative of the Central Division. Foster will be succeeded as assistant Eastern Division Sales Manager by C. K. McClellan, formerly a district representative in the Central Division. In the Advertising Department George E. Wennerly has been named assistant to



H. H. Howard

W. K. Cox, advertising manager. Burt Powell, formerly manager of publicity and Sales Publications Division, has been promoted to the position of assistant advertising manager.

Staudt Joins Harnischfeger

George L. Staudt has been appointed advertising and sales promotion manager of Harnischfeger Corporation, Milwaukee, Wis. Mr. Staudt was formerly director of advertising for Standard Register Co. of Dayton, O. During World War II he served as chief, Counter Intelligence Corps Branch, G-2, War Department. Prior to entering the service, he was assistant advertising manager for the Illinois Central R. R. and at one time was employed with the Benson and Dall Advertising Agency of Chicago.



G. L. Staudt

St., Utica 2, N. Y. and Corp Brothers Inc., 28 Mason St., Providence 3, R. I. Two foreign distributors have also been named to handle Stooddy products: Manuel Sigren, Casilla 2697, Santiago, Chile, who covers the entire country and Bandeira De Mello, S. A., Av. Pres. Wilson 198—Sala 603, Rio de Janeiro, Brazil, who will represent the organization in the central area from Bahia to the state of Santa Catarina.

Warg Promoted by Texaco

Richard J. Warg has been appointed division sales manager for Texaco asphalt products in the New England states, with headquarters at Boston. He has been associated with The Texas Co.'s Asphalt Sales Department since 1933. Until his recent promotion, he had been connected with the organization's Chicago Division, selling its asphalt products in various middlewestern states. He spent four years in the Navy during the war, which he joined as an enlisted man, coming out with the rank of lieutenant commander.



R. J. Warg

Stooddy Expands Distributor List

The distributor organization of Stooddy Company, manufacturers of hard-facing alloys, Whittier, Calif., has been further broadened by an addition of the following firms within recent months: Mobile Welding Supply Co., Inc., 2 Government Street, Mobile 12, Ala.; Morris, Wheeler & Co., Inc., Fox St. and Roberts Ave., Philadelphia 29, Penn.; Maine Oxy-Acetylene Supply Co., 7 Minot Ave., Auburn, Me.; The Alfred B. King Co., 200 Winchester Ave., New Haven 3, Conn.; Fuller Supply Co., Inc., 12 Liberty

New Hercules Branch

Hercules Motor Corporation, Canton, O., has opened a new factory and sales branch in Odessa, Tex. The new outlet augments the factory branches and retail stores already in operation at Los Angeles, Calif.; Salem, Ill.; Houston and Kilgore, Tex.

Inquiry Blank

Check items of equipment or materials on which you wish to receive information. Give your name and address in the space at foot of page (if convenient, please print or use typewriter), detach and mail to **ROADS AND STREETS**, Readers' Service Department, 22 West Maple Street, Chicago 10, Ill. We will pass your inquiry along to manufacturers and see that you get desired information promptly.

Check products below on which you wish us to obtain information for you:

I AGGREGATE:

- 1 Bins and Hoppers
- 2 Conveyors
- 3 Crushers
- 4 Portable Plants
- 5 Screens

II BITUMINOUS:

- 6 Batchers
- 7 Finishers
- 8 Distributors
- 9 Dryers
- 10 Heaters
- 11 Plants (central)
- 12 Plants (travel)

III CONCRETE:

- 13 Batchers
- 14 Buggies and Carts
- 15 Finishers
- 16 Joints, Expansion and Contraction
- 17 Mixers (under 1 yd.)
- 18 Mixers (1 yd. up)
- 19 Pavers
- 20 Reinforcing Steel
- 21 Road Forms (1000' set)
- 22 Tower
- 23 Truck Mixers

IV CRANES:

- 24 Crawler Mounted
- 25 Truck Mounted
- 26 Piledrivers

V GRADERS:

- 27 Blade, self propelled
- 28 Blade, pull type
- 29 Blade, under truck
- 30 Elevating

VI LOADERS AND TRENCHERS:

- 31 Front-end loader (tractor mounted)
- 32 Loader, bucket type and belt type
- 33 Trencher or Ditcher

VII HAULING EQUIPMENT:

- 34 Dump Truck
- 35 Other Trucks
- 36 Dump Wagons, tractor drawn
- 37 Flatbed Trailers

VIII PUMPS:

- 38 Centrifugal
- 39 Diaphragm
- 40 Piston

IX POWER UNIT:

- (Independent)
- 41 Gasoline
- 42 Diesel

43 Electric

X ROLLERS:

- 44 Power (Smooth)
- 45 Pneumatic Tire
- 46 Sheepsfoot

XI TRACTORS:

- 47 Crawler
- 48 Rubber Tired

XII TRACTOR EQUIPMENT:

- 49 Bulldozers
- 50 Power Control Units
- 51 Rippers
- 52 Scrapers, tractor drawn
- 53 Scrapers, self-powered

XIII BUCKETS:

- 54 Clamshell
- 55 Concrete
- 56 Dragline
- 57 Orange Peel

XIV SHOVELS AND DRAGLINE:

- 58 Crawler (under 1 yd.)
- 59 Crawler (1 yd. up)
- 60 Truck Mounted

XV ROCK DRILLS AND AIR TOOLS:

- 61 Air Compressors
- 62 Backfill Tampers
- 63 Clay Diggers

XVI MISCELLANEOUS:

- 71 Buildings, portable
- 72 Earth Drills, power
- 73 Light Plants
- 74 Lubrication, Service
- 75 Mowers, Highway
- 76 Power Saws
- 77 Soil Stabilizing Equipment
- 78 Spreaders, sand
- 79 Street Flushers
- 80 Street Sweepers
- 81 Welders
- 82 Cutting Torches
- 83 Hydraulic Jacks
- 84 Hydraulic Control Equipment
- 85 Hand Tools
- 86 Hoists, derrick type
- 87 Highway Guard
- 88 Snowplows, rotary
- 89 Snowplows, v or wing

Be sure to fill in name and address below:

Title

or profession

Your Name

Name of your company

or governmental department

Type of work for which

equipment will be used

Street Address

City

State

County

DIAMOND T AND WHITE 6x6 HEAVY DUTY TRUCKS 4 TO 10 TON PRIME MOVERS OFFERED AT BIG SAVINGS

We have available Civilian made and

G. I. TRUCK PARTS

A complete line consisting of Transmissions, rear ends, complete motors, differentials, axle shafts, truck chassis, carburetors, magnetos, bearings, trailers, gears, wheels. Largest stock in Middlewest.

Tell us your needs—Write Dept. RS5

UNITED AUTO PARTS CO., Inc.

1901 Troost Ave.

Kansas City, Mo.

FOR SALE

30 ft. stake Fruehauf trailer.
1 yd. tumble scraper.
35 ft. P&H crane boom with cable, etc.
Above three items may be seen at Nagle-Hart at Eau Claire, Wis.

A-C WM eat. tractor with cable dozer and tilting trailer.

12 ft. steel rack hydraulic dump platform, Anthony 10 in. hydraulic hoist dump body, 4-6 yd., St. Paul 8 in. hydraulic dump body, 4-5 yd. New.

Ford truck, Thornton tandem drive, with new loading jammer. New motor.

May be seen at Medford, Wisconsin.
JOE BOOR, Phone 5538, Medford, Wis.

HEAVY DUTY WINCHES

Gar Wood 7 M (capacity 80,000 pounds) and 6 M (capacity 60,000 pounds) heavy duty winches, both new. Real bargains for large contractors or builders. To be sold at cost. Phone or wire B. J. Diederich for details.

SMITH, INC.

1620 First Avenue North Phone 4411 Fargo, N.D.

1—TD tractor crane with bulldozer blade.
1—No. 22 Caterpillar tractor with angledozer.
1—Clark tractor with bulldozer attachment.
1—60 LeRoi air compressor.
1—315 LeRoi air compressor.
1—Unit crane.
1—400 amp. P&H welder.
1—Moretrench well point system with 300 ft.—6-in. header pipe and all necessary fittings.
1—78 mixer on pneumatic tires.

Gray-Robinson Construction Co.

819 S. 15th St., Manitowoc, Wis.

FOR SALE STEEL BUILDING

MILL TYPE 80' x 200'. Main aisle 50' wide, with 10 ton crane runway. Runway extends outside building 60 feet on each end. Lean-to aisle 30' x 200'. Will quote as is, where is, DISMANTLED MATCH MARKED F.O.B. or re-erected your site. Engineering foundation plans furnished. Additional information, price, etc., furnished upon request.

WM. M. QUINN STEEL CO.

Phone LD 80-P. O. BOX 180 SIDNEY, OHIO

FOR SALE

1—Jaeger Model 16 SW, 3 bag concrete mixer, 90" Skip—batchmeter water pump mounted on 4 pneumatic tired wheels. Price F.O.B., Cairo, Illinois, \$2,300.00.

1—16S Smith concrete mixer, Model 458, 90" Skip—batchmeter. Water Pump mounted on 4 pneumatic tired wheels. Price F.O.B., Cairo, Illinois, \$2,100.00.

EDGAR STEPHENS & SONS, Inc.

General Contractors CAIRO, ILL.

FOR SALE

1 160S Pumpcrete machine with 800 ft. 7" pipe

1 1¼ cu. yd. shovel front—362 Marion

1 6S Smith Concrete Mixer #471, practically new

3 HK500 cu. ft. I. R. Portable Compressors

2 315 cu. ft. I. R. Portable Compressors—Gas

2 Eimco, Model 21 Muckers, 30" and 36" gauge

2 12" Coppus Ventair Blowers

6 D-35 I. R. Drifters

1 Drill Carriage

2500 Ft. Track—30" gauge

3 7½ K. W. Generators

4 1 cu. yd. Orange Peel Buckets

Pipe, cars, drill steel and other miscellaneous tunnel equipment

Nicholas DiMenna & Sons, Inc.

1525 Blondell Ave., New York 61, N. Y.
Tel. Talmadge 9-7070

FOR SALE

1—34E Ransome Dual-Drum Paver Diesel, inclined boom, Hydraulic control. Good Condition\$5,500.00

3—Jaeger-Lakewood Model H Finishing Machine 20 to 25 ft. Excellent condition. Each\$3,750.00

1—R. B. Power Finegrader, 20 to 25 ft. Excellent condition\$4,500.00

1—Koehring Bullfloat, 20 to 25 ft.\$2,250.00

2500 L.F. 9" Road Forms } \$0.80 per ft.

2700 L.F. 10" Road Forms }

M. J. BOYLE & CO.

2480 Elston Avenue
Chicago 47, Illinois
ARmitage 6-1636

FOR SALE

Hendrix ¾ yd. light weight drag bucket.
New condition. \$450.00.

Blaw-Knox ½ yd. clam bucket. New condition. \$700.00.

100 H.P. 220 volt 60 cy. 900 RPM rebuilt motor and starter. \$1000.00.

MONTPELIER STONE CO.

Phone 92-W Montpelier, Ind.

EQUIPMENT CLEARANCE

1—P & H crane, ¼ c.y., Model 350. Rebuilt \$7500.00

1—Foote 27E Mixer, Serial #4193, 6 cyl. engine, 10% overload drum \$2000.00

1—Buckeye Trencher, Model 12-91. New in 1947. Wheel 24" x 5½", Buda engine \$7500.00

1—Allis-Chalmers HD7 tractor with pusher blade, 1 yr. old \$6500.00

1—Austin power pick up sweeper, 4 pneu. tires. Rebuilt. Bargain \$1500.00

1—Austin tandem roller, 8 ton. Used \$2500.00

1—New International TD9, complete with Cardwell side boom assembly \$7500.00

1—Shovel attachment for Model 6 Northwest. New.

1—Shovel attachment for Model 105 Northwest. Rebuilt.

CASEY & EMMERT, INC.

1424 W. Ohio St. Chicago 22, Ill.
CONSTRUCTION EQUIPMENT

FOR SALE

3—1½ yd. Erie heavy dredging buckets

1—2½ yd. Wellman DXL Dragline bucket

3—½ yd. Bucyrus-Erie RC Dragline buckets

1—½ yd. Wellman PD Clamshell bucket

1—½ yd. Brosius single line bucket

1—1 yd. Brosius single line bucket

Write for complete listings and descriptions with prices, etc.

Greatly reduced prices on equipment.

THE W. T. WALSH EQUIP. CO.

12750 Berea Road Academy 1600
CLEVELAND 11, OHIO

FOR SALE

Byers ¾ yd. Crane and dragline, Model 83, long Crawlers, wide shoes, powered by "Caterpillar" Diesel motor, 40 ft. boom, 10 ft. extension, 1500 watt Koeler light plant, plus floodlights.....\$12,000

"Caterpillar" D8 tractor, 1H Series, equipped with LeTourneau dozer and D.P.C.U. motor completely overhauled... \$10,000.00

H. A. ROE CO.

Ph. No. 2 Dixon, Illinois

FOR SALE

1 Model LS50 Link-Belt Speeder ½-yard with trench hoe attachment. 1 year old.

2 D4 ¾-yard Speeder shovels in good condition.

1 ½-yard American shovel in good running condition.

RIHM MOTOR CO.

1641 University Ave., St. Paul, Minn.
NEstor 7833

BARGAINS IN USED EQUIPMENT

- Model AD Oliver-Cletrac Diesel tractor, 30 h.p. with Heil hydraulic dozer. Like new.....\$4,000.00
- Brown-Hoist crawler crane, 40 ft. boom, gas powered, 10 ton capacity at 12'.....\$3,200.00
- LaPlant-Choate C-114 cable operated scraper, 13½ to 16½ yd. capacity\$6,500.00
- 160' Davey air compressor, on Dodge truck.....\$1,500.00
- J-233 Hebard shop mule "Rebuilt" with new engine....\$1,000.00
- ½ Bag Concrete Mixers.....\$250.00

Also, compressors, air tools, centrifugal pump, suction and discharge hose.

F.O.B. Chicago—Loaded on car.

Phone or Write

GREAT LAKES SUPPLY CORP.

Equipment Division—Phone: Atlantic 5-6622

1026 W. 50th St.

Chicago 9, Illinois

Emmett C. Watson Co. Contractors Equipment

- Caterpillar D-13000 Diesel Engine\$ 4,500.00
- Cedarapids Portable Crushing Plant\$15,000.00
- Littleford Trail-O-Type Distributor\$ 1,200.00
- Marion 1½ cu. yd. Shovel, equipped with D-13000 Caterpillar Diesel Engine\$15,000.00
- Michigan Model C-16 Trenchhoe & Dragline, S/N 3243. Price on application.
- Northwest Model 80D Dragline, 2¾ cu. yd., S/N 8566...\$29,925.00
- Northwest Model 8 Dragline, 3 cu. yd., S/N 6254.....\$28,350.00
- P&H Model 855 Dragline, 3 cu. yd.....\$29,925.00
- P&H Electric Welder, 300 Amp., Trailer Mtd.\$ 800.00
- All equipment in excellent operating condition.

310 E. Branders St.
Louisville 8, Ky.
Phone: Calhoun 5373
SALES—SERVICE

FOR SALE

One Johnson 600 cubic yard cap., 8 compartments; 34 ft. Hex shaped mounted on 14" H-Beam, 67 ft. long; Batching Equipment, Water Batcher; Collectors, two, 2 yard Smith Mixer, Cement Elevator, about 300 ft. 24" Sand Conveyor with under truck feed conveyor; Hot water equipment, Air compressors, Heating Plant, Office Equipment. A plant built about two years ago and on account of its location was condemned and only was in operation about a month. Sold on Court Order. The plant is complete and is for sale at less than one half of the cost. If you are contemplating building a ready mix plant it will pay you well to come and see this before buying.

HASS WHOLESALE, INC.

3922 W. Sample St., South Bend 21, Ind.
Telephone—3-9407

REASONABLY PRICED USED EQUIPMENT

- 1947 Model 31 Hanson Shovel-Hoe
1947 Model 31 Hanson Shovel only
1¾ Yd. Marion Type 37 Steam Shovel
LS-85 L.B.—Spdr. Shovel—1 yd. Dpr.
Byers "Jr." Shovel-Hoe
Byers Model 81 Shovel
2½ Yd. Rex MotoMixer—GMC Truck
105 Ransome Mixer—PLWT—4 Wheels
65 Smith Mixer—PLWT—new condition
10-12 ft. Blaw-Knox Hydraulic Finisher
105 LeRoi Compressor—4 Pneu. Tires
310/210 I-R Compressor—AB Mack Truck
1-Ton Clyde Tandem Roller
1-Ton Ferguson Tandem Roller
Cletrac "55"—Isaacson Angledozer

also QUICK DELIVERY on
many NEW EQUIPMENT items
Shovels - Buckets - Bins
Conveyors - Compressors

J. SHUMAN
HOWER CO.
85 N. Genesee UTICA, N. Y.
Ph.: 2-5218

FOR SALE

- 1 1947 Model Byers Junior Shovel.
1 24" Troughing Belt conveyor 80' long with gasoline engine.
1 Koehring Model 301 ¾ yd. shovel front.
1 Byers Model 80 ¾ yd. shovel front.
1 Model 522 Barber-Greene bucket loader.
1 New Universal 2 yd. batcher.
1 Used 1 yd. batcher.
1 Erie GA-52 yd. bin complete with dial scale.
1 Completely enclosed bucket elevator, 20' long.
1 Ransome ¾ yd. stationary mixer complete with electric motor.
1 Knickerbocker 1 yd. stationary mixer complete with gasoline engine.
1 Universal 9" x 12" Jaw Crusher.

SERVICE CONSTRUCTION & EQUIPMENT COMPANY

6335 Manchester Avenue
St. Louis 10, Missouri Tel.: Sterling 7078

CLEARING HOUSE

FOR SALE CONCRETE PRODUCTS PLANT EQUIPMENT

- 1—Stearns 18 cu. ft. mixer complete with 10 H.P. motor
1—Model A. Clipper Stripper all power operated block machine
1500—8" aluminum pallets
1500—12" cast iron pallets
3000—4" cast iron pallets
1—8" mold box
1—12" mold box
1—4" mold box
1—Brick attachment—new
25—block racks—50 block capacity
1—30 H.P. boiler
1—Barret Cravins electric lift truck with charger
2—Multiplex flue block machines—16x16 used. 16x20 new—150 pallets each
1—24" well curb form
1—18" well curb form
1—10" well curb form
1—6" well curb form
1—bucket elevator complete with belt and motor

This equipment is less than two years old

**BLACK HILLS CONCRETE
PRODUCTS COMPANY**
Rapid City, S. D.

- 1—Euclid Loader in perfect condition Serial Number and Model BV3-No. 5
1—Caterpillar Tractor, D-8, Good condition Serial Number 2U-174
4—Euclids, 58-W, Bottom Dumps. Excellent Condition Models 25FD-7, Serial Numbers 4264, 4265, 4994, 5571.

The above machinery must be sold as a complete unit for a price of \$65,000.00 f.o.b. Dry Branch, Georgia. Two or four additional Euclids are available at a bargain price.

We also have

- 1—HD-7W Allis-Chalmers Tractor, Serial No. 15207 with "F" Carco Winch, Serial No. 2869, completely overhauled \$6,550.00

- 1—HD-7W Allis-Chalmers Tractor, Serial No. 13526. Buckeye Bulldozer, Serial No. CB-2472, Buckeye Model GLT MD DD Control Unit, Serial No. M-6316, completely overhauled \$6,950.00

Allis-Chalmers HD-14 Gar Wood Cable Angle Doser A-1 condition. Completely overhauled \$8,950

- 1—L-90 Allis Chalmers Engine, Serial No. 2275, OBB, completely overhauled \$2,100.00

Int. T-14 & Winch A-1 Condition \$4,100

- 1—Model 10-B Bucyrus-Erie Dragline, Ser. No. 18689, good condition \$4,500.00
The above prices are f.o.b. Macon, Ga.

We have

- 1—Model 77 Thew-Lorain 1½ yard shovel, Serial No. 5332, purchased in 1937. Has Caterpillar Diesel Engine. Good condition. \$10,000.00

This machine is f.o.b. Dry Branch, Ga. All prices and machinery are subject to prior sale or other disposition.

GEORGE PARK TRACTOR COMPANY
1822 Houston Ave. Macon, Ga.
Phone Ivy-951

FOR SALE

Caterpillar "60" Tractor, overhauled.
Caterpillar "60" Elevating Grader, condition good, new chains, sprockets and bottom roller.
Power take-off units for "D-8's" & "60's."
5-kilowatt Master Light Plant, condition like new.
Grayco Convey Lubricator, new, 3 hose reels, 250 lb. containers.

G. J. VAN DE RIET & SONS
Fairmont, Minnesota
Phone 279

USED DUMP TRUCKS PERFECT CONDITION

NEW 3 YARD BODIES—7" HOIST
2 TON FORD TRUCKS—GALION BODIES
SAVE \$1000.00 PER UNIT
DOWNTOWN FORD SALES CO., INC.
2419 W. Washington St., Indianapolis, Market 2381

FOR SALE

- 1—Complete Shovel Front for ¾-yd. Buckeye Model 70.
In Excellent Condition.
BONANDER AND COMPANY
1420 Washington Ave. S.
Minneapolis, Minn. GENEVA 9311

FOR SALE

Motor Generator plant—New and Un-used—Model HI Cummins Diesel Serial 39501. Rogers Generator Model PH 245A Serial 391. 25 KW, 3 phase, 60 cycle 110-220. Complete with control panel and automatic warning devices. Army surplus. For quick sale \$2,100.

Also 1030 Good Roads Roller Bearing Crusher, used but in good condition—\$800.

H. S. CATRON, Owner
JUNCTION CITY, KENTUCKY

CRUSHERS

GYRATORY: 30" Super. McCully; 36" Allis-Chalmers; also Nos. 12, 10, 9, 8, 7½, 6, 5, & 4. JAW TYPE: 24x36, 25x40, 22x50, 30x42, 42x48, and smaller sizes down to 7"x9".

REDUCTION TY: 2', 3', 4' & Symons Cone; Nos. 15, 25, 37 & 55 Kennedy; 36" Taylor TZ, 1'8" & 2'4" TY; No. 36 Teismith Gyrasephere; 7 & 10" Newhouse; Stedman 30 x 36" Imp. Type. ROLLS: Allis-Chalmers 72x30, 54x24, 54x20, 40x15 & 18x10. Pioneer 18x30. Universal 16x24. New Holland 24x16 & 16x10; McLanahan 30"x60", 18x24 & 18x30 Single Roll. Also others.

HAMMERMILLS: Williams Nos. 2, 3, 4, & 6; Day No. 40 & No. 70; Gruendler 2XB & 3XB; Dixie 2024 & 3650.

MILLS: Hardinge 3"x8", 6"x22", 6"x3", 8"x3' & 8"x4'; Kennedy 4x8, 5x6, 5x11; Marcy 4x5, 6x4; Smidth 16B Tube Mills; Raymond 4 & 5 Roller Mills; Bonnot, Fuller, Sturtevant & others.

CRUSHING PLANTS: 25x40 Cedar Rapids Portable, Diesel Power. Others portable & stationary. BINS & BATCHERS: 70 & 150 yd., 3-comp., Etc. TRUCKS: Euclids, FWD, Internationals, Etc.

SHOVELS: 80-D Northwest 2½ yd. combination Link Belt Speeder K-580, 3 yd., and others.

DRAGLINES: 6 Yd. Walker, 14½ boom, Diesel Lorain Model 40-A Crane-Drill, Diesel.

MISCELLANEOUS ITEMS
Barges, Bins, Buckets, Rollers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Elevators, Excavators, Generators, Hoists, Kiln, Draglines, Drag Scrapers, Dredges, Drills, Engines, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc. In many sizes, types and makes at low prices. (In many cases, equipment is available in the United States and Canada. What you need may be near your plant.)

MARIETTA ALEX T. McLEOD KANSAS

FOR SALE—Used Korpak, hand operated, Concrete Block Machine complete with electric motor and all attachments for 8x8x16 with 1560 pallets; 6x8x16 with 1000 pallets; 4x8x16 with 500 pallets. Also one Barrett Lift Truck. Will sell at 50 per cent off on equipment, 25 per cent off on pallets. All good as new, ideal for small plant or to get started in business. Now operating at our plant, Orleans, Ind.

RADCLIFF & BERRY, INC.
Hardinsburg, Indiana

DUMP TRUCKS FOR SALE

- 2 New K B 6 International Dump Trucks. Never been used.
- 2-ton Chevrolet Dump Trucks, 46 Models.
- 2-ton Ford Dump Trucks, 46 and 47 Models.
- 2 W A 14 White Dump Trucks, 41 Models.

Crushers For Sale

- 1 13B Teismith Crusher, late Model.
- 1 10A Teismith Crusher with elevator and screen.
- 1 32' Teismith Reduction Crusher.
- 1 9x30 Teismith Gaw Crusher.
- 1 Model BD Cletrac Tractor with ¾ yd. bucket and Bulldozer blade.

All the above in first class condition
For information contact

T. J. ATKINS & CO., INC.
Hamburg Pike Phone 3-7633
Jeffersonville, Ind.

FOR SALE

Used Badger Trencher model 202-B, with pneumatic tires and half track changeover. 16" Shovels and Heavy Duty Chain, practically new. This machine is less than two years old, and is in good condition. \$3950 f.o.b. Rochester.

B-G EQUIPMENT CO., INC.
1180 Scottsville Road, Rochester 11, New York

FOR SALE

1—BUCYRUS-ERIE 15-B, 1947 model, Dragline & Clamshell Crane, Budz gas engine, extra long crawlers, 40' boom, ¾ yd. Hendrix Dragline Bucket, Erie Clam Bucket.

1—INSLEY K-12, 1946 model, Dragline & Trench-Hoe. Machine in like new condition.

1—P & H 150, 1940 model, Dragline & Clam Crane, rebuilt, perfect condition, tractor type crawlers, manual controls, Mercury gas engine. Price only \$4,500.

1—LORAIN MC-3 1942 model, MOTO-CRANE, 70' boom, Dragline and Clamshell attachments, including buckets, hook blocks, etc. Machine in very good condition. Priced to sell.

1—LORAIN 40, 1943 model, Dragline & Trench-Hoe, Perfect.

1—BAY CITY 45, 1946 model, Dragline w/ "Caterpillar" Diesel Engine, wide shoes, 45' boom. Almost new, priced right.

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1—HETHERINGTON & BURNER 2500# Asphalt Batch Plant, including Dryer, Tower, Bins, etc., New 1947. All electric, good condition.

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3 Cat DW 10's/CW 10 Scoops

new in 1945. Low hours and good shape

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1—D-12, K38 American Pulley Base	100.00
1—60 H.P. 1160 RPM 440 V. 60 cyc., 3 phase motor, with switch, controller and resistance, mounted on frame	1,400.00
1—12" Compass Endless Belt	100.00
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1—40 HP 860 RPM 440 V. 60 cy. 3 HP Motor with switch, controller and resistance mounted on frame	1,000.00
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1—2'0" wide x 158'0" lg. SSFB Dorr Classifier Serial No. US3579 less motor	1,152.00
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Would sell scraper and winch separate. All equipment in excellent condition.

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- 1—Rogers Low-Boy with 80 Ton Drop Deck. 750x18 tires.
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2—Northwest Model 25 crawler pullshovel

1—diesel 1—gas

2—Northwest Model 25 crawler shovels or cranes, 60' boom

1—Northwest Model 25 diesel truck crane, 60' boom

1—Bucyrus Erie 38-B 1½ cu. yd. crawler shovel, General Motors diesel engine.

1—Marion Model 371 crawler crane/drag combination—gas engine.

1—Manitowoc Model 2000 crawler crane/drag combination—diesel engine.

1—Lima Paymaster crawler pullshovel crane combination—gas engine.

1—Lorain 1¾ yd. crawler diesel shovel.

1—Lorain Model 40 Truck Crane, 35' boom mounted on 10 wheel Mack.

1—Osgood Model 200 gasoline crawler shovel—Pullshovel crane

1—Lima Model 602 diesel shovel and crane

1—Link Belt Speeder diesel crawler shovel ¾ yd.

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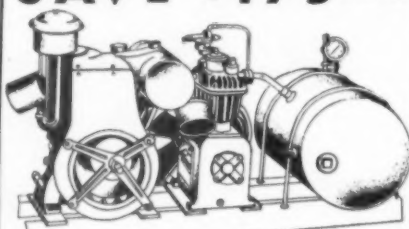
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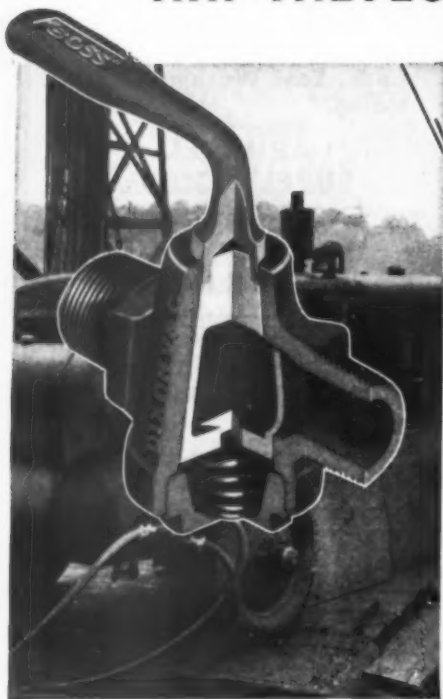
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